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**All communications to be addressed:**

**"The Editor, Journal of Agriculture, Victoria Square, Adelaide"**

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T. PASCOE,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

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### Kangaroos and Wallabies, Close Season.

A proclamation in the *Government Gazette* notifies that the close season for kangaroos and wallabies has been altered. In future the close season will be during the months of October to March, inclusive; the open season being during the months of April, May, June, July, August, and September.

---

### Pickling Seed Wheat.

"I agree that it is better to pickle wheat a few days before sowing, although I cannot condemn entirely the practice of pickling the night before sowing, providing thoroughly effective methods are adopted," comments the Director of Agriculture (Professor Arthur J. Perkins). "The advantages of pickling a few days before seeding may be summarised as follows:—When you pickle grain, all the spores or seeds of the fungus are in the dormant or resting state, and in this state they are able to resist the action of the bluestone better than when they are in active life. Moreover, however thoroughly you may pickle, it is always possible that individual spores may escape coming in contact with the bluestone; this applies particularly to those spores which are sometimes caught up in the minute bristles to be found at the end of the grain of wheat. The moisture of the pickle may be sufficient to induce germination of those spores which are able to resist action of the bluestone; but, as soon as they germinate, their tender germinating tubes come in contact with the bluestone which covers the grain, and this will bring about their destruction. If, therefore, you suspend seeding operations for a few days, you give time to allow these spores to germinate, and consequently to bring about their destruction. If you sow the wheat immediately after pickling, the moist earth, or rain which follows, will tend to wash away the bluestone, and spores which have escaped may then germinate without danger. Delaying seeding, therefore, has the advantage of rendering the action of pickling more complete than if you were to sow immediately. Wheat can be pickled several months before seeding, without injuring germination, providing it is thoroughly dry subsequently to pickling. Pickled wheat left over at seed time would be safe to sow 12 months later if kept protected from weather and vermin, from the general point of view of germination. On the whole, however, owing to contamination from surrounding objects, and the frequent carelessness which obtains in such matters, personally I should prefer to pickle a second time."

---

### *Paspalum Dilitatum.*

*Paspalum dilitatum*, says the Superintendent of Experiments (Mr. W. J. Spafford), is essentially a summer-growing crop, and as such should only be sown (seed) or planted (rooted sections) after the soil has warmed up in the spring. Although this *Paspalum* is very hardy, and often spoken of as a good drought-resister, it is a water-lover, and strong growth and heavy returns will only be secured from the crop

where plenty of irrigation water is supplied, or where the land is naturally wet in the spring and summer. This grass does not suffer from an excess of water, and grows best in swampy conditions. In comparatively dry conditions this grass is hardy, withstanding the dryness very well, but at the best will only make a fair grazing crop. The best way to establish the crop is by rooted sections planted about 3ft. apart each way; but if the crop is to be raised from seed, 8lbs. to 10lbs. per acre is necessary. If once well established, much trouble is experienced in preparing the land for any other crop to take its place, in some cases needing three disc ploughings to cut up the sod into pieces small enough to handle, then many cultivations and harrowings, and much rubbish to cart off the land.

## DEPARTMENTAL DOINGS.

The Director of Agriculture (Professor Arthur J. Perkins) attended the quarterly meeting of the Murray Bridge Herd Testing Association. He visited the extension of the Ral Ral scheme of the Chaffey Irrigation Area, with a view to reporting on same. The Director also was present at the opening of the winter school for farmers at the Roseworthy Agricultural College.

The Dairy Expert (Mr. P. H. Suter) visited Renmark and Clare, attended a meeting of the Murray Bridge Herd Testing Society, lectured to the Farmers' winter classes at Roseworthy Agricultural College, and inspected a number of metropolitan dairies.

Peterborough and Nuriootpa Butter Factories were visited by the Assistant Dairy Expert (Mr. H. J. Apps) who took the opportunity of giving instruction in neutralisation and pasturalisation. Various suburban dairies were visited, also farms in the Georgetown district, and the Gladstone Butter Factory. Lectures were given at the Murray Bridge High School, Laura Agricultural Bureau, and the Farmers' Winter School at Roseworthy Agricultural College.

### POULTRY, ETC.

Mr. D. F. Laurie (Poultry Expert) inspected a number of poultry plants in the Crystal Brook District; attended the McLaren Vale Poultry Show, and addressed the Farmers' winter classes at Roseworthy Agricultural College.

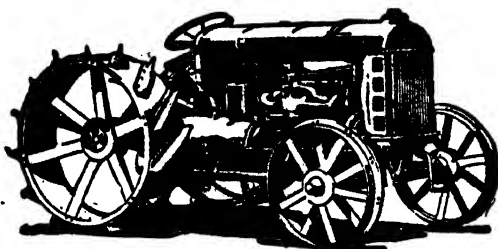
### GENERAL.

The Secretary Advisory Board (Mr. H. J. Finnis) addressed a meeting of the Williamstown Women's Branch of the Agricultural Bureau. Mr. F. C. Richards addressed a meeting of the Mount Bryan Branch.

Mr. C. H. Beaumont (Horticultural Instructor, Southern District) gave pruning demonstrations at Middleton, Louth Road, and Gilberts.

### FARM BUILDINGS, ETC.

Mr. J. Paull (Field Engineer) lectured to the Farmer's Winter School at Roseworthy Agricultural College. He also supplied plans of a shearing shed to Mr. H. J. Richardson, Jamestown.



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## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"W. M. S.," Wudinna, reports mare with frequent swellings of the body; also stallion with swelling on penis, and the horse is unable to draw the organ back into sheath.

Reply—The mare appears to be subject to flatulent colic. Repeated attacks of this trouble are likely to be due to some error in diet. Young green stuff and certain herbage, such as trefoil, or sudden change in the feed are the most common causes. Working too soon after a full feed, or allowing a large quantity of water when tired, are likely to cause flatulence. Feed her carefully. She should be put on a definite ration. Water her after feeding. Treat next attack by giving turpentine 2 tablespoonsful, raw linseed oil 1 pint. Mix, and give carefully. Do not hold the head too high. Do not hold the tongue. Give her plenty of time to swallow. With regard to the stallion, you should support the penis by a broad bandage passing over the back. Keep this clean. Bathe the organ once daily with lukewarm water containing one teaspoonful of alum to the pint.

"L. A. von D.," Halidon, has aged mare constantly lying down, turns head around, and looks around at her stomach. When standing in the stable she is continually lifting her feet up and down.

Reply—The fact that she lies down to an abnormal degree and the other symptoms, such as stiffness, &c., may be ascribed to chronic laminitis (founder). Use her only for slow work. A useful shoe for these cases is a bar rocker shoe. This is an ordinary bar shoe thinned out across the toe and heel, so as to give the foot a slight rocking movement.

"A. C.," Hammond, reports a number of young pigs with a swelling around the pizzle.

Reply—I advise you to put them in clean, dry sties. Bathe the part daily with weak lukewarm Condy's solution. If necessary, syringe a little of the fluid into the sheath. They should be all right again with a week's treatment.

"H. W. B.," Halidon, has four-year-old colt with cut above knee. The injury has healed, but the joint is very swollen.

Reply—Depending upon the extent of the injury, the swelling may be of a more or less permanent character. Try painting it with the following mixture:—Tincture of iodine and Stockholm tar, equal parts; mix. Paint this on daily, but allow a longer time between the applications if the skin becomes tender. Swellings of this kind are usually very slow in dispersing.

"K. S. McF.," Port Lincoln, reports death of sheep. Appear to have been poisoned. Lying down, breathing heavily, and died within an hour. No froth at mouth. Tongues turned a bluish color.

Reply—There is not sufficient evidence that poisoning was the cause of death. A diagnosis of plant poisoning should depend upon the following facts:—The existence of a plant known to be poisonous in the pastures, the symptoms of

poisoning in stock associated with the plant in question, and the presence of the particular plant in the stomach of the dead animal. The symptoms and treatment of plant poisoning depend upon the plant causing the trouble. Under certain circumstances valuable fodder plants, such as trefoil and lucerne, may cause digestive disorders and death, usually from bloating. A *post-mortem* examination might have been useful in determining the cause of death. If you suspect any plants of being poisonous I shall be glad to have them identified.

"B. D. B.," Kybybolite, reports cow's teats swollen and skin peeling off.

Reply—The case appears merely to be a severe chronic case of this trouble. I recommend the following application:—Friar's balsam 1 part, glycerine 3 parts; mix. Apply this twice daily after milking with a camel hair brush.

"F. J. P.," Port Pirie, has four-year-old thoroughbred mare which injured her knee. The joint is swollen, and the swelling extends up to the shoulder. Blisters have been applied, but a hard swelling remains.

Reply—The swelling, which is now bony in character, is likely to be permanent. The course of treatment by blistering with a one to one red iodide ointment three weeks after the injury was much too severe, and may be partly responsible for the present condition. The usual strength of this blister is one to eight. Apply a blister of the latter strength by rubbing in thoroughly for 5mins. Tie her head up short until the irritation has subsided. Reapply in a fortnight, and turn her out for three months.

"E. C.," Saints, has three-year-old free-working colt with a swelling of the leg from the knee to the shoulder.

Reply—There is probably pus forming in the shoulder lump. Foment it daily with hot water. If you can detect the formation of an abscess it should be opened with a clean, sharp knife. Make the incision so as to drain it effectively. Keep clean by daily washing with warm water and soap, and afterwards apply a little antiseptic lotion.

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## ROSEWORTHY AGRICULTURAL COLLEGE HARVEST REPORT, 1920-1921.

[By W. J. COLEBATCH, B.Sc., M.R.C.V.S., Principal of Roseworthy  
Agricultural College.]

(Continued from page 830.)

### THE WHEAT CROPS.

The outstanding feature of the recent harvest was the phenomenal success of the College wheat fields. For the first time in the history of the farm, the average yield per acre reached 30bush., and the total wheat harvest exceeded 9,500bush. The experimental plots, which were sown during a spell of wet weather, did not thrive as well as the farm crops; but nevertheless, they produced over 21bush., which is well over a bag per acre in advance of the normal wheat yield. On these plots a large assortment of types was under trial, and even in the farm fields no less than 23 different varieties were represented.

The area devoted to many of these, however, was relatively small. Of the 23 varieties grown, seven occupied 75 per cent., and 16, 25 per cent. of the total wheat area. The average wheat yield from the former group was 30bush. 50lbs., whilst that of the latter was 27bush. 24lbs. per acre. The highest yield for the season, and one of the highest individual yields yet recorded here, was given by an early strain of Cossbred 53, or Zealand Blue. This originated from a selection made in the College hand plots in 1915, and it has now established itself as a reliable grain-producer and hay-yielder in districts that depend on early mid-season types. It returned 38bush. 5lbs. of well-filled grain this harvest, and also produced appreciably more hay than any other variety. The next most prolific types were:—King's Red (37bush. 15lbs.), Fortune (35bush. 21lbs.), King's White (34bush. 34lbs.), Early Gluyas (34bush. 21lbs.), and Marshall's Golden Return (32bush. 21lbs.).

Only two varieties gave less than 20bush., one being Daphne (19bush. 18lbs.), and the other Florence (18bush. 52lbs.). The former is a College-bred wheat, and, like the latter, it has a tendency to shed its grain too readily, which probably accounts for the relatively inferior results obtained from these two varieties in a favorable season. Florence has been much favored in certain districts on account of its earliness and the resistance it offers to smut infestation, but it has not succeeded here, and there does not seem to be even a remote possibility of it displacing the standardised and approved forms that constitute the bulk of our wheat crops. We rely mainly on Early Gluyas, King's White, King's Red, Caliph, Late Gluyas, Federation, and Queen Fan,

and of these the last two are restricted to much smaller blocks than are given over to the other five.

The quality of the grain harvested last season was, at the time of harvest well up to normal grade, but pressure of work compelled us to allow some varieties to lie in the stook overlong, and exposure to the weather led to a loss of bloom and other undesirable changes due to "weathering."

TABLE XXIV.—*Summary of Wheat Harvest, 1920.*

Farm crops	Area.	Total Yield.	Acre Yield.	
	Acres.	Bush. lbs.	Bush.	lbs.
Farm crops . . . . .	218.981	6,567 47	30	0
Experimental plots (1 acre and over) . . .	122.561	2,638 29	21	32
Totals . . . . .	341.542	9,206 16	26	57
Experimental plots (under 1 acre) . . .	13.560	305 17	22	31
Grand totals . . . . .	355.102	9,511 33	26	47

For some years the mean wheat yield has fluctuated between 17 and 18bush., and as the results of each harvest are recorded it becomes more and more evident that under present circumstances the true average lies about midway between these two limits. In 1914 it fell to 16bush. 54lbs. and then rose quickly to 17bush. 50lbs. in 1916. The partial failure in 1919 reduced the mean to 17½bush. and the present harvest has had the effect of restoring it to the 1916 level. We now have the data for a period of 17 years, and it is significant of the reliability of the calculated mean figures that an increase of 9bush. 41lbs. in the year's average modifies the mean yield to the extent of only 34lbs.

TABLE XXV.—*Showing the Average Yields of Wheat on the College Farm, 1904-1920.*

Season.	Rainfall.		Area Under Wheat. Acres.	Average Yield per Acre. Bush. lbs.
	"Useful." Inches.	Total. Inches.		
1904 . . . . .	11.60	14.70	330.00	18 3
1905 . . . . .	14.23	16.71	212.00	24 11
1906 . . . . .	16.31	19.73	318.00	14 30
1907 . . . . .	13.96	15.13	178.00	13 20
1908 . . . . .	15.52	17.75	258.52	22 14
1909 . . . . .	21.15	24.05	328.47	25 5
1910 . . . . .	16.79	23.87	267.35	16 38
1911 . . . . .	9.45	13.68	234.98	14 17
1912 . . . . .	13.05	14.97	232.89	19 36
1913 . . . . .	10.82	15.66	333.07	6 32
1914 . . . . .	6.12	9.36	148.69	11 28
1915 . . . . .	18.33	19.76	367.271	21 13
1916 . . . . .	20.25	23.23	330.937	24 44
1917 . . . . .	17.25	21.86	353.473	17 32
1918 . . . . .	10.53	12.01	320.326	17 36
1919 . . . . .	8.22	12.88	329.957	9 22
1920 . . . . .	16.76	19.30	341.542	26 57
Means for 17 years	—	—	—	17 50

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# BRUNNINGS

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64, ELIZABETH ST., MELBOURNE.

The College wheat fields in 1920 were Nottle's C, Flett's B & C, and No. 5A. In addition, wheat plots were grown under various experiments in No. 4, Grainger's A, B, C, and D, and in Nos. 3 and 7B.

FIELD.—NOTTLE'S C.—AREA, 78.88 ACRES.

<i>Previous History.</i>			
1897 .. ..	Bare fallow.	1909 .. ..	Wheat, oats, and lucerne.
1898 .. ..	Wheat.	1910 .. ..	Fallow.
1899 .. ..	Wheat.	1911 .. ..	Wheat, oats, and beans.
1900 .. ..	Bare fallow.	1912 .. ..	Wheat, oats, and barley.
1901 .. ..	Wheat.	1913 .. ..	Bare fallow.
1902 .. ..	Pasture.	1914 .. ..	Wheat.
1903 .. ..	Bare fallow.	1915 .. ..	Pasture.
1904 .. ..	Wheat.	1916 .. ..	Fallow.
1905 .. ..	Bare fallow.	1917 .. ..	Wheat.
1906 .. ..	Wheat and barley.	1918 .. ..	Pasture.
1907 .. ..	Pasture.	1919 .. ..	Bare fallow.
1908 .. ..	Bare fallow.		

In this field were located the late and mid-season varieties, and it was originally intended that they should be sown early in May; this proved to be impossible owing to the weather and the lie of the land, and it was not till June 9th that the drills left the paddock.

The fallow was in good condition at seeding, and notwithstanding the lateness of the first ploughing (September 10th) the soil settled down firmly and the seed went in fairly well. Better results might have been obtained had the seeding operations not been interrupted by broken weather. As it was, however, most of the varieties gave an excellent account of themselves as shown in the statement of yields. The wheat was drilled at the rate of  $1\frac{1}{2}$  bush. and superphosphate at 2cwts. per acre.

TABLE XXVI.—*Showing Wheat Yields obtained in Nottle's C, 1920.*

Variety.	Selection.	Area. Acres.	Total Yield. Bush. lbs.	Acre Yield. Bush. lbs.
Early Crossbred 53 . . . . .	4	2.627	100 4	38 5
Fortune . . . . .	5	1.929	68 12	35 21
Marshall's Golden Return . . . . .	1	2.899	95 13	32 51
Marshall's No. 3 . . . . .	12	3.904	112 6	28 17
Yandilla King . . . . .	7	5.213	146 42	28 9
Yandilla King . . . . .	8	3.016	80 22	26 39
Lott's White . . . . .	3	1.607	40 41	25 19
Federation . . . . .	10	12.595	322 59	25 39
Federation . . . . .	11	4.004	96 54	24 12
Queen Fan . . . . .	9	18.148	419 2	23 5
Queen Fan . . . . .	10	6.914	151 59	21 59
Daphne . . . . .	7	3.688	71 11	19 18
Totals . . . . .	—	66.544	1,705 25	25 38

## FLETT'S B AND C.—AREA, 116 ACRES.

*Prior History.*

1902 .. ..	Fallow.	1911 .. ..	Wheat, barley, oats.
1903 .. ..	Wheat.	1912 .. ..	Fallow.
1904 .. ..	Fallow.	1913 .. ..	Wheat barley, oats, rye.
1905 .. ..	Wheat.	1914 .. ..	Barley.
1906 .. ..	Pasture.	1915 .. ..	Wheat.
1907 .. ..	Fallow.	1916 .. ..	Pasture.
1908 .. ..	Wheat.	1917 .. ..	Barley.
1909 .. ..	Pasture.	1918 .. ..	Pasture.
1910 .. ..	Fallow.	1919 .. ..	Bare fallow.

In the original cropping scheme provision was made for a hay crop in Flett's B, and a grain crop in Flett's C, but owing to the heavy yields obtained elsewhere it was decided ultimately to harvest both divisions for grain. Both fields were ploughed up at the end of June, and received three cultivations during the summer. The drills were preceded by the cultivators, and seeding took place between 20th and 25th May in the portion intended for hay (Flett's B), and a fortnight later in Flett's C, which was set apart for a grain yield test of early wheats. The early sown varieties were King's Red and King's White, and it is evident from the appended figures that time of seeding may materially affect the final results. It should be mentioned also that these two wheats were cut and threshed, whereas the others were harvested with a complete harvester. In view of these differences in treatment, the yields from King's Red and King's White are not strictly comparable with those from the rest of the plots, and hence, in order to gauge the capacities of the new varieties, Caliph, a well established cross between King's White and Marshall's No. 3, must be taken as the standard.

It will be seen that the average for all selections of Caliph is 27bush. 46lbs., and that Sultan, Felix, and Iguana have all given yields slightly in advance of this standard. Maharajah averages one pound less, President, Rajah, and Faun fall two or three bushels below it, and in the case of Florence the discrepancy amounts to nearly 9bush. per acre.

TABLE XXVII.—Yields of Wheat—Flett's B and C, 1920.

Variety.	Selection.	Area. Acres.	Total Yield.		Acre Yield. Bush. lbs.
			Bush.	lbs.	
King's Red . . . . .	12	25.440	947	49	37 15
King's White . . . . .	12	13.741	478	53	34 51
King's White . . . . .	13	13.533	463	45	34 16
Iguana . . . . .	1	4.326	124	13	28 43
Sultan . . . . .	3	4.768	134	22	28 11
Felix . . . . .	1	4.564	128	26	28 8
Maharajah . . . . .	3	1.805	52	35	29 8
Maharajah . . . . .	2	1.533	40	4	26 8
Caliph . . . . .	4	12.108	336	39	27 48
Caliph . . . . .	3	2.486	67	28	27 8
Caliph . . . . .	2	2.725	76	49	28 48
Rajah . . . . .	1	4.223	108	48	25 46
President . . . . .	1	1.328	34	7	25 41
President . . . . .	3	0.783	19	25	24 43
Faun . . . . .	4	1.941	51	15	26 24
Faun . . . . .	3	1.090	21	9	19 24
Florence . . . . .	—	2.214	41	47	18 52
Totals . . . . .	—	98.608	3,127	54	31 43

## FIELD No. 5A.

The prior history of this field is summarised below:—

1897 . . . . .	Bare fallow.	1909 . . . . .	Wheat, oats, barley, and lucerne.
1898 . . . . .	Wheat.	1910 . . . . .	Pasture.
1899 . . . . .	Wheat.	1911 . . . . .	Pasture.
1900 . . . . .	Bare fallow.	1912 . . . . .	Pasture.
1901 . . . . .	Wheat and oats.	1913 . . . . .	Bare fallow.
1902 . . . . .	Pasture.	1914 . . . . .	Wheat, oats, and barley.
1903 . . . . .	Bare fallow.	1915 . . . . .	Pasture.
1904 . . . . .	Wheat.	1916 . . . . .	Bare fallow.
1905 . . . . .	Bare fallow.	1917 . . . . .	Oats.
1906 . . . . .	Wheat and oats.	1918 . . . . .	Pasture.
1907 . . . . .	Bare fallow (limed).	1919 . . . . .	Bare fallow.
1908 . . . . .	Wheat, oats, and barley.		

The cultural treatment of this field was similar to that meted out to Nottle's C, but fallowing began a little earlier and seeding operations were concluded a week or 10 days later. The seed sown was Early Gluyas—the most consistent and successful grain producer in this district—and two selections from it, namely Late Gluyas and Bearded Gluyas. As in the other wheat fields superphosphate was applied at the rate of 2cwts. per acre in addition to the bushel and a half of graded seed.

TABLE XXVIII.—Wheat Yields—No. 5A., 1920.

Variety.	Selection.	Area. Acres.	Total Yield.		Acre Yield. Bush. lbs.
			Bush.	lbs.	
Gluyas . . . . .	14	6.457	225	55	34 59
Gluyas . . . . .	13	32.869	1,127	43	34 11
Late Gluyas . . . . .	13	0.794	24	39	31 3
Late Gluyas . . . . .	14	12.703	332	49	26 12
Bearded Gluyas . . . . .	14	1.006	23	42	23 33
Totals . . . . .	—	53.829	1,734	48	32 14

## YIELDS OF CHIEF VARIETIES GROWN AS FARM CROPS.

The past season has accentuated the importance of Early Gluyas as a grain producer in this locality. It has been the most prolific yielder on this farm for nearly 20 years, and although no fresh seed has been introduced since 1904, it still leads the way with a seasonal average of 34bush. 25lbs., and a mean average for the past six years of 23bush. 15lbs. per acre.

The next highest yielder over the period 1915-1920 is Caliph, a cross between King's White and Marshall's 3A, and it is closely followed by King's White and King's Red, the former being about a bushel ahead at present.

Amongst other varieties grown on farm areas for a shorter period than is covered by the appended table, mention should be made of Federation which averaged, approximately, eight bags, and Early Crossbred 53, which returned the highest yield of all, namely, 38bush. 5lbs.

TABLE XXIX.—*Showing Yields of Chief Varieties of Wheat grown as Farm Crops, 1915-1920.*

Variety.	Area.	Highest Yield.	Lowest Yield.	Average Yield.	Mean Yield
		Bush. lbs.	Bush. lbs.	Bush. lbs.	1915-1920. Bush. lbs.
Early Gluyas . . . . .	39.326	34 59	34 11	34 25	23 15
Caliph . . . . .	17.319	28 48	27 8	27 46	21 39
King's White . . . . .	89.879	34 51	16 7	22 20	20 44
King's Red. . . . .	69.823	37 15	23 58	30 25	19 43
Late Gluyas . . . . .	13.497	31 3	26 12	26 29	19 13
Yandilla King. . . . .	8.229	28 8	26 39	27 36	18 15
Queen Fan . . . . .	25.062	23 5	21 59	22 47	17 57
Marshall's 3B . . . . .	3.904	28 17	28 17	28 17	14 11

TABLE XXX.—*Showing Yields of Latest Strains of College Hand-Selected Pedigreed Wheats Comparatively with those obtained from Earlier Strains in Previous Seasons.*

Variety.	Selection.	1920.	1919.	1918.	1917.	Means.	Period.
		B. L.	B. L.	B. L.	B. L.	B. L.	
Sultan . . . . .	4	26 46	22 47	35 15	20 50	26 24	1917/20
Caliph . . . . .	5	29 11	19 56	23 40	29 10	24 19	1916/20
Ford . . . . .	6	25 23	19 12	24 26	29 25	24 10	1916/20
Fortune . . . . .	6	22 21	14 58	20 9	21 5	23 27	1916/20
President . . . . .	4	28 4	20 23	30 4	15 9	23 26	1917/20
Felix . . . . .	4	27 10	20 41	22 20	18 25	22 24	1917/20
King's White . . . . .	15	32 39	21 40	22 47	22 33	20 58	1909/20
Faun . . . . .	5	27 20	26 7	18 8	11 57	20 53	1917/20
Emperor . . . . .	4	14 41	16 40	28 44	23 20	20 51	1917/20
Early Crossbred 53 . . . . .	5	24 14	19 10	15 41	23 8	20 48	1917/20
King's Red . . . . .	15	30 34	19 33	26 3	23 20	20 24	1909/20
Queen Fan . . . . .	11	20 41	17 36	16 25	21 55	20 6	1910/20
Federation . . . . .	12	17 59	12 37	18 30	29 41	19 39	1909/20
Bearded Gluyas . . . . .	15	26 47	24 5	23 43	18 35	19 21	1909/20
Gluyas . . . . .	15	22 4	20 42	26 25	24 44	19 10	1909/20

TABLE XXX.—*continued.*

Variety.	Selection.	1920.		1919.		1918.		1917.		Means.		Period.
		B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	
Marshall's No. 3	14	19	43	18	11	16	0	21	38	18	16	1909/20
Rajah	4	19	53	17	35	19	27	18	8	18	46	1917/20
Late Gluyas	15	26	33	20	35	18	14	22	18	18	24	1909/20
Maharajah	4	15	31	23	23	15	22	19	8	18	16	1917/20
College Eclipse	13	17	59	18	21	21	38	25	4	17	46	1909/20
Yandilla King	9	25	12	11	58	17	20	16	38	16	56	1912/20

TABLE XXXI.—*Showing Yields of Some New College Crossbred Wheats (1915-1916 Crosses).*

Variety.	Selection.	Pedigree.	Yield per Acre.					
			1920.		1919.		Means.	
			B.	L.	B.	L.	B.	L.
Dan	2	Daphne X Fane (1915)	22	6	39	34	30	50
Fortress	2	Fortune X Anvil (1915)	25	13	27	51	26	32
Gypsy	2	Egypt X Gluyas (1915)	23	50	22	10	25	0
Canute	2	Fortune X Caliph (1915)	23	28	20	35	22	2
Jordan	2	Fortune X Canaan (1915)	20	44	22	33	21	39
Pharaoh	2	Caliph X Fane (1915)	21	1	21	22	21	12
JG. iv.	1	Emperor X Caliph (1916)	28	30	—	—	—	—
JH. x.	1	Sultan X Caliph (1916)	28	15	—	—	—	—
JD. x.	1	Fan X Caliph (1916)	27	3	—	—	—	—
JC. i.	1	Anvil X Caliph (1916)	26	23	—	—	—	—
JE. iv.	1	Anvil X Sultan (1916)	26	20	—	—	—	—
HX. iv.	1	Caliph X Queen Fan (1916)	24	27	—	—	—	—
JN. ii.	1	Rajah X Gluyas (1916)	23	27	—	—	—	—
JF. viii.	1	Rajah X Caliph (1916)	22	42	—	—	—	—

## EXPERIMENTAL WHEAT CROPS.

The area devoted to permanent experiments and selection plots was 136-121 acres, and the average return worked out at 21bush. 38lbs. per acre. The averages of the different fields are shown below, but it may be of interest to those who follow the progress of the College experiments to read, in addition, details of some of the groups, and I have therefore included the results obtained from the Depth of Ploughing and Grainger's Manurial Plots.

TABLE XXXII.—*Showing Yields from Plots Ploughed at Different Depths, 1920.*

Depth of Ploughing.	Total Produce.		Grain per Acre.	
	Tons cwt. lbs.		Bush. lbs.	
2in.	2	1 94	27	38
4in.	2	5 65	29	45
6in.	2	3 37	29	9
8in.	2	8 54	29	14
10in.	2	8 43	31	27
12in.	2	9 15	32	0

TABLE XXXIII.—*Showing Yields of Plots Manured with different Quantities of Superphosphate per Acre, 1920.*

Manure.	Total Produce.		Grain per Acre.	
	Tons cwt. lbs.		Bush. lbs.	
No manure	1	6 45	15	51
½ cwt.	1	18 74	24	23
1 cwt.	2	1 7	26	34
2 cwt.	2	6 32	26	33
3 cwt.	2	1 64	26	27



TABLE XXXIV.—*Summary of Wheat Yields from Experimental Areas.*

Field and Plot.	Variety.	Selection.	Area. Acres.	Acre Yield. Bush. lbs.
Grainger's B—				
Depth of ploughing . . . .	King's Red. . . .	14	5.724	29 52
Selection Plots—				
No. 7B . . . . .	Various. . . . .	—	13.688	27 29
Grainger's A—				
Cultivation plots . . . . .	King's Red . . . .	13	24.559	27 9
Grainger's D—				
Reversion Plots . . . . .	King's White . . . .	14	6.400	24 51
Grainger's C—				
Manure plots . . . . .	King's Red . . . .	13	14.100	23 53
Selection Plots—				
No. 3 . . . . .	Various . . . . .	—	15.445	21 6
Permanent Plots—				
No. 4 . . . . .	King's White . . . .	13	56.205	16 7
Totals . . . . .			136.121	21 38

In the preparation of the foregoing report, and in the supervision of the work in the fields, I have been ably assisted by Mr. R. C. Scott, Experimentalist, and Mr. E. L. Orchard, Farm Superintendent.

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## NATIONAL SCHEMES FOR THE IMPROVEMENT OF LIVESTOCK.

[By W. J. COLEBATCH, B.Sc. (Agric.), M.R.C.V.S., Principal Roseworthy Agricultural College.]

Not the least important amongst the subjects referred to the Agricultural Conference is the improvement of farm livestock, and as very little attention has been paid hitherto to the grading up of herds and flocks, through the agency of the Government in this State it is advisable that the methods successfully adopted in other countries should be clearly understood.

With the object of setting out concisely the schemes in operation elsewhere, I have prepared the following notes, and whilst it is not claimed that the information given is in any way complete, the salient features of each system are given, and it is hoped that these may serve to arouse interest in the subject and enlist the support of those who are not yet fully persuaded that a national scheme is desirable.

### SWITZERLAND.

#### CATTLE.

Since 1893 the Swiss Government have voted £16,000 (£20,000 in 1902) to supplement efforts of cantons to improve breeding of cattle. Money is awarded in form of premiums for bulls, cows, and small herds, and small grants to encourage formation of breeding societies and herd books. Permanent board of judges travels round, and competing animals are paraded, and premiums allotted, but payment is deferred for nine months, in order to get satisfactory evidence that animals have been used successfully for breeding purposes.

Judging is on fixed scale of points, and selected animals are grouped into classes according to number of points scored. All in same class receive same premium.

The amount of premium depends on money available, the Government contribution being a pound for pound subsidy to the amount set aside by the district concerned. Bulls over 15 months receive from £4 to £16, according to class. No premium is to be less than £4 for each bull or cow. Similar system is in operation for sheep and goats.

#### HORSES.

1. Government undertake to purchase suitable stallions on behalf of cantons and pay half cost.

2. Cantons lease these to breeders, and supervise their use for breeding for at least six years.

3. After six years Government may repurchase or declare stallion unfit for breeding, with or without compensation, or may grant breeder annual subsidy of 5 per cent. on estimated value.

4. In addition, stallions are lent to cantons for short periods from Government studs.

5. Premiums to brood mares and fillies are awarded annually by judges appointed by Government. Premiums amount to £2 8s. for fillies, two to three years, and £8 16s. for mares, three to five years.

Payment in case of fillies is made a year after award on production of evidence that they were retained in country for breeding purposes; in case of mares, after birth of foal by approved sire. The same animal may receive premium once as filly and once as mare, but not more.

6. Subsidies are granted to horse shows and competitions for provision of prizes for horses bred from stallions imported with Government aid or approved stallions.

7. Subsidies up to £2 per head are awarded for grass land on which foals from approved stallions are pastured.

*General.*—To encourage breeders to exhibit at foreign shows grants may be made to defray transport and insurance of animals.

#### ENGLAND AND WALES.

In 1913 the British Board of Agriculture was granted £40,000 per annum for five years for the purpose of improving livestock. A scheme was inaugurated in February, 1914, and at the conclusion of the five-year period the board decided that "the scheme shall be continued as one of its normal activities, and shall be financed in future out of the board's own vote."

Whilst admitting that the influence of war has retarded progress, and that, in any event, five years is too short a period to bring out the full effects of such measures, the board feel satisfied that the scheme is sound in principle, and that there is already evidence of real progress, not only in methods of breeding and quality of produce, but also in breaking down the prejudice and arousing interest amongst the ignorant and careless breeders.

The objects in view when the scheme was prepared were:—

1. To educate breeders to the use and value of pure-bred sires and to the commercial advantages of breeding from animals which, by reason of their deeply fixed type and characteristics, are more likely to be prepotent than the nondescript ill-bred sires frequently used.

2. To grade up the inferior stock by the introduction of more systematic and definite methods of breeding.

3. To educate farmers in the general management, breeding, and rearing of livestock.

4. To improve the milking qualities of dairy cattle by encouraging the keeping of milk records.

5. To provide financial assistance, so that these advantages may be brought within the reach of small farmers.

6. To foster the spirit of co-operation by discriminating in favor of societies and clubs.

#### ORGANISATION.

The country is divided into 12 provinces, and a livestock officer is appointed in each province.

Provincial committees are formed, to allocate grants to the different counties, and another committee is appointed in each county to attend to applications and make recommendations to board after consultation with livestock officer.

Livestock officers are experienced men with farm animals, and their advice is much sought after. They are frequently attached to a college or farm institute. On them the success of the scheme largely depends.

Many of the leading farmers and breeders serve on these committees and are of great assistance to the livestock officer, and the scheme generally.

#### THE SCHEME.

The board's scheme aims at the improvement of cattle, heavy horses, and pigs. A separate scheme is in operation in respect of light horses.

In order to impress farmers with the advantages of co-operation, grants in respect of stallions and boars were at first made only to clubs or associations, but subsequently the premium system was allowed with regard to boars (since 1916). Even in the case of bulls, preference is given to co-operative societies or clubs, but when these cannot be formed premiums are made available to individuals.

The rules of participating societies must be approved by the board, but registration is not essential.

Preference is given to societies or clubs formed amongst small farmers, and such organisations constituted for the purpose of carrying out the board's scheme are given prior claims over pre-existing societies.

#### GRANTS FOR BULLS.

1. No grant exceeding £12 per annum is made to any individual bull owner, or exceeding £15 to any club or society.

2. Not more than four annual grants of £12 are made to any individual, or more than five of £15 to any society for each approved bull provided.

3. Grants are only made to individuals when livestock officer is satisfied that a club or society cannot be formed in a district in which the provision of a good bull is necessary.

4. No grant is made to any individual owner of a bull unless livestock officer is satisfied the bull will be made available to appreciably greater number of cows belonging to small farmers than previously.

5. Not more than one-third of sum available in any year is to be spent on grants to individuals.

6. Societies may provide bulls by purchase or hire. The owner of hired bull need not be a member of society.

7. In case of purchase, society must select a custodian from amongst its members, and must raise by contribution or donation sufficient funds to cover cost of bull, insurance and maintenance, salary of secretary, and general expenses, and also sinking fund charges on a scale sufficient to meet cost of replacement of bull when necessary.

8. In case of hiring, society must guarantee service of not less than 25 cows belonging to its members. The owner of bull will receive £12 or less, according to agreement, fee of not less than 2s. 6d. per cow served, and the right to have not more than 15 of his own cows served. The grant of £15 to the society, with a nominal subscription of 1s. per member, will be sufficient to defray expenses in most cases, as the owner of the bull is responsible for maintenance, insurance, &c.

#### GRANTS TO MILK-RECORDING SOCIETIES.

1. Grants are given annually to societies whose members record the milk yields obtained not less frequently than once a week.

2. Societies in receipt of grants are to employ "testers" to check the records by surprise visits at least once in every six weeks.

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3. Amount of grant will be half the expenses of society up to £50 in respect of each whole-time "tester" employed for every 20 herds in possession of members of a society.

#### PROGRESS OF SCHEME.

The following table summarises the activities of the administrative committees during the first five years:—

Year.	Boars.			Bulls.			Horses.		Milk Recording.	
	Socie- ties.	Indi- viduals.	Boars.	Socie- ties.	Indi- viduals.	Bulls.	Socie- ties.	Stal- lions.	Socie- ties.	Cows.
1914-15	115	—	115	369	43	497	65	72	16	7,331
1915-16	180	—	193	489	28	633	88	97	20	9,811
1916-17	186	15	216	543	15	659	93	108	22	12,950
1917-18	172	92	264	578	14	710	94	110	25	14,404
1918-19	156	167	350	604	7	721	101	122	27	19,793

#### EFFECTS.

1. The use of highly-bred sires has stimulated interest in the quality of dams and an increased demand for pure-bred stock is noticeable.

2. Independent farmers are, by force of example, driven into buying better class sires.

3. The nondescript sires are being steadily weeded out, and a strong feeling has arisen concerning the wandering mongrel bull.

4. Some societies have urged the board to prohibit the use of inferior or unsound sires.

5. Calves are more highly valued, and the establishment of the board's register, on the basis of performance, has caused many valuable calves to be reared and saved for breeding.

6. The formation of herd societies has been encouraged, and the number of entries in stud books and herd registers greatly increased.

#### DIFFICULTIES.

In the 1919 report it was pointed out that the general practice was to use a bull for two seasons, and then sell him for slaughter.

When the price obtained equals or exceeds the purchase figure, all is well, but if it falls below cost the owner is disappointed. When the bulls averaged £30 to £40 the risk of loss was small, but now the cost price is about £60 on the average, the premium will have to be raised. Nor can the service fee be raised to any extent, owing to the competition of mongrel sires.

Again, the high price of milk encourages farmers to dispose of their calves as soon after birth as possible, and hence the placing of bulls in districts where this practice is widespread is admittedly difficult.

#### SCOTLAND.

In 1912 the Scottish Board of Agriculture inaugurated a system of State aid to stock breeders in order to improve the average quality and productive capacity of livestock. Their scheme embraced horses and

ponies, cattle, sheep, pigs, poultry, and also the livestock shows. In the first instance assistance was rendered to the poorer farmers in certain of the northern counties, where the holdings are small and primitive methods of farming are still in vogue. The congested areas received special treatment, but the scheme has since been extended in a somewhat different form, so that farmers in all counties may, if they wish, reap advantage of the appropriation granted for improving stock.

#### CATTLE.

There are three distinct schemes in force for effecting improvement in cattle.

1. *Loan Scheme.*—This applies only to the poorer crofting counties in the north. Bulls are provided by the board, and on receipt of application from properly constituted local committees, they are loaned under certain conditions. The board must be satisfied that the committee represents the owners of not less than 40 cows, and that the bull will be properly kept and cared for. All expenditure in connection with the conveyance of bull from and to nearest station or port and the maintenance of bull is borne by the committee, which undertakes to bear all responsibility for any damage done by him whilst in their keeping, and, further, to return him in good order when required. The bull remains the property of the board. In 1919 no less than 262 bulls were thus loaned, and on the whole the scheme has worked well, but in some cases the bulls are not fed and attended to in a satisfactory manner. Herein lies the weakness of the system, but notwithstanding the fact that this constitutes a valid objection in some instances, periodical inspection is found effective in most cases in securing fair treatment, and in the board's experience, where a bull has been stationed three to four years—the usual period of loan—at one centre, appreciable improvement has resulted by grading up the native stock.

2. *The Grant Scheme.*—This also affects only northern counties, and is confined to those districts in which there is no crofter population. Grants are made to societies or committees, which arrange to purchase or hire bulls for the use of their members, as well as for the service of cows belonging to small farmers, farm servants, and others in like circumstances. Bulls, to be approved, must have been entered or accepted for entry in the herd book, must have been passed by the board's officer, and must have passed the tuberculin test within six months of inspection. The amount of grant varies from £7 10s. to £15, according to breed, but in no case will exceed 50 per cent. of price of purchased bull. For hired bulls the grant ranges from £6 to £12. and second-year grants are never greater than four-fifths of the original. Service fees to those in poor circumstances must not exceed 2s. In 1919 there were 173 bulls in respect of which grants were paid, and no less than 9,834 cows were served by them.

3. *Approved Societies Scheme.*—This applies to the lowland counties, and differs from the grant scheme only in matters of detail. Financial assistance is only obtainable under this scheme through an

approved society, and in order to satisfy the board, a society must fulfil the following conditions:—

- (a) It must be one of its purposes to provide by hire or purchase one or more bulls for the service of cows belonging to its members.
- (b) It must consist of 10 or more members, owning at least 40 cows in all.
- (c) It must appoint a secretary and treasurer annually, who may or may not be a member.
- (d) It must appoint annually a committee of management of not less than three members.
- (e) It must levy an annual subscription, the amount to be fixed by the society.
- (f) The constitution and rules must be approved by board.
- (g) Provision must be made for service of cows belonging to small farmers and impecunious cattle-owners who are non-members on terms approved by board.
- (h) Copy of annual abstract of accounts and balance-sheet, properly audited, must be sent to board at end of each season.

In other respects the scheme is similar to the grant system, except that the maximum service fee is not fixed by the board. The extent to which this scheme is availed of is shown by the figures for 1919. In that year premiums were paid on 275 bulls, and the number of cows served was 13,726, or nearly 50 per bull. It should be noted that, whereas the Irish Department works through county committees and the English Board through provincial and county committees, the Scottish scheme is administered from headquarters.

### IRELAND.

The Department of Agriculture and Technical Instruction for Ireland have adopted the premium system—that is the payment of an annual grant to the owner of a high-class pedigreed bull, on condition that cows in the neighborhood are served at a nominal fee.

The department works through county committees, which appoint livestock committees from amongst their members. The livestock committee is the executive body, and administers the detailed schemes as approved by the county committee and sanctioned by the board. In arranging details the committee endeavors to secure to small farmers as large a share of the benefits as possible.

The department retains control of policy, approves or rejects bulls, and those passed on inspection receive a certificate of eligibility for a premium.

The purchaser of such a bull, if selected by the local committee as being suitably located and worthy of acceptance as owner and caretaker of a premium bull, has only to conform to the rules laid down by the board to substantiate his claim for a premium. He is required to take precautions against the spread of contagious abortion by





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I have great faith in Karswood Pig Powders. When I came home, in February, 1919, after being discharged from hospital through wounds, my wife had bought a pig which to all appearances was only walking about to save funeral expenses. I tried putting it in a warm place and coddling it a bit, but no change. I saw your advertisement for Karswood Pig Powders and what they had done, so I decided to give them a trial. I got a packet and started giving the pig two a week. After a week or two the pig seemed more contented and began to improve, so I determined to keep on with Karswood Pig Powders; and, take it from me, I did not regret it, as by the end of the year that pig, which I would not have given 10s. for when I came home, was worth over Twenty Pounds (£20).  
April 5th, 1920.

W. REDFORD.

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regularly disinfecting his bull; to keep the bull in good health and condition; to charge not more than 2s. 6d. per service for small farmers and up to 5s., according to agreement, for larger landholders.

Each yearling is to serve not less than 30 cows and older bulls not less than 40. After these numbers have been served, the owner may fix any fee he pleases.

The value of the premium varies from £10 to £25. The payment is made as soon after receipt of required particulars as the board is satisfied that the conditions imposed have been fulfilled.

The breed of bull is determined by the board, on the recommendation of the county committee, and only those entered in a herd book are accepted. Bulls up to four years of age are eligible, provided they show superior qualities; even five-year-olds are considered in pure-bred registered dairy bulls. Owners of bulls two years and over must produce evidence of fruitfulness in the preceding year. A premium may be awarded each year up to the age limit, so that the owner may receive in grants considerably more than the purchase price. The department reserves the right to apply the tuberculin test to any premium bull, also to brand (or mark) and inspect the same at any time.

In exceptional cases the department may, under certain conditions, purchase bulls on behalf of selected applicants, or grant them loans to enable them to purchase approved bulls.

This scheme has been in force for over 15 years, and there are now over 1,100 premium bulls standing for service in Ireland.

### COMPARISON OF THE SYSTEMS.

In Ireland we find the premium system only, in England the premium system and a system of grants to societies or clubs, and in Scotland grants to societies or clubs and the loaning of bulls in certain congested districts.

The premium system, *i.e.*, the payment of money to individual owners of approved bulls, is generally admitted to be the most expeditious method of improving the quality of cattle in a district, and it is particularly adapted to a country like Ireland, in which the great majority of the landholders are farming small areas. The recipient of the premium is the owner of the bull, and consequently it is to his interest to maintain the animal in good order, since he himself must bear any loss resulting from resale.

The co-operative society, or club system, is necessarily much slower in producing widespread effects on the character of stock kept throughout a country, even when the population is relatively dense, and in a sparsely peopled country like South Australia it would be inapplicable except in one or two dairying centres. The chief advantage of this system is the stimulus it gives to the co-operative movement amongst farmers, but this benefit may be dearly paid for if it be the reason for postponing the adoption of a national premium scheme that will quickly increase the value per head of the nation's livestock in a material degree.

As evidence of the demand for good sires that has arisen in Ireland since the premium system was inaugurated, the following figures are quoted:—

	1884.	1912.
Number of Shorthorn breeders . . .	75	335
Number of Hereford breeders . . .	4	22
Number of Aberdeen-Angus breeders	2	96
Shorthorn entries at Dublin Show ..	179	562
Hereford entries at Dublin Show ..	12	121
Aberdeen-Angus entries at Dublin Show . . . . .	14	221

Those in a position to assess fairly the effects of the scheme state that it has not only led to great improvement in the ordinary commercial cattle, but has also aroused much interest in the breeding of pure-bred cattle, and the increased demand for good sires has led to the formation of many more studs.

Not only are the cattle of the country being simultaneously improved, but all the farmers receive better prices for their stock; the stock fatten quicker or yield more heavily; and hence the productive capacity of the farms is raised.

The loan system which has been tried in this State has been relatively unsuccessful owing mainly to the lack of care and meagre rations given to the bull by the custodian. This is the general experience wherever the system has been tried, and hence it cannot be regarded as a satisfactory or reasonably safe measure for the Government to adopt.

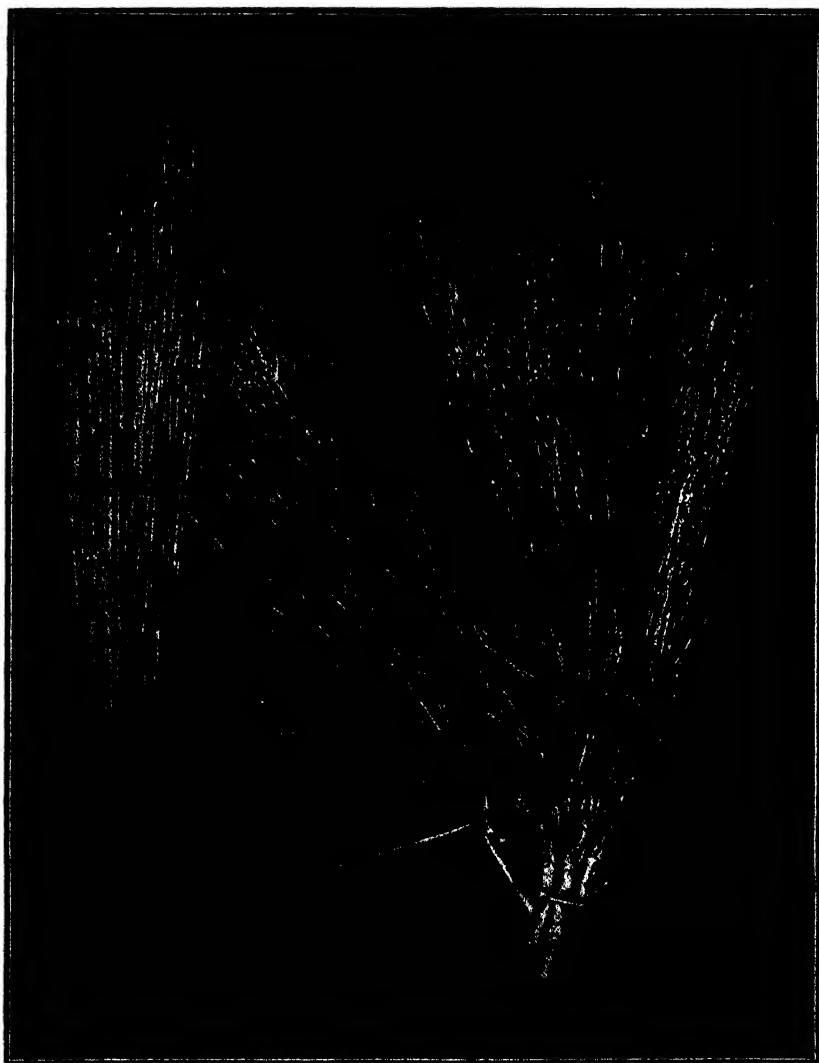
In my view, the scheme adopted in Ireland embodies the chief features that it is desirable to incorporate in any system designed to suit our circumstances. I refer in particular to the granting of certificates of eligibility to animals that are passed by official judges, without regard to the granting of premiums. This in itself will establish in the future a definite standard of quality and purity in the same way as the granting of certificates to stallions has done in the past, and it will also provide those who wish to become purchasers of premium sires to have a wider choice than would be possible under the special inspection system. The determination of breed selection of owner, and general management of local affairs connected with the scheme are matters that are better left in the hands of district committees whenever possible, but it is essential to the continued success of the scheme that full powers be vested in the central authority.

### **WHEAT AND ITS POWER OF GERMINATION.**

"It is not possible to state definitely how long a grain of wheat will retain its power of germination," says the Director of Agriculture (Professor A. J. Perkins). There is not the slightest doubt, however, that the percentage of seed that germinates in any given sample of wheat becomes lower from year to year, and it is probable that, if kept thoroughly dry, some grains would survive for several years, say, seven or eight years. Professor A. J. Ewart, of Melbourne, carried out several experiments in this direction, and came to the conclusion that within eight to 10 years over 50 per cent. of the grains in a sample of seed-wheat would have lost all power of germination.

## BROOM CORN ON RECLAIMED SWAMPS.

On some of the irrigable areas of the River Murray, broom corn can be successfully grown, providing the necessary work in connection with the growth of this crop is done properly, says the Superintendent of Experimental Work (Mr. W. J. Spafford), in reply to an inquirer.



**Broom Millet**

*a* A good sample of brush.

*b* Sample of brush from a neglected crop

(From *Farmers' Handbook*, N.S.W.)

As this crop is a summer-growing annual, the seed should not be sown until the soil has properly warmed up, which will be the end of September or so, and seeding can take place from then until well into November. Before the seed is put in, the land should be well prepared by ploughing and cultivating, and if it remains loose after these cultivations, it should be compacted in some way. The seed should be sown in rows about 3ft. to 3ft. 6in. apart, using about 10lbs. seed per acre. This can be done with the ordinary seed drill by mixing the 10lbs. of seed with 46lbs. of bonedust, and sowing it through the manure box of the drill, after having removed four out of every five manure stars and replacing them with big-headed rivets or short bolts, and setting the manure gears to sow  $2\frac{1}{2}$  cwt. per acre. As only one hoe in five will be sowing seed, the rows will be 35in. or 40in. apart, depending on the spacing of the hoes on the drill. If only a small area is to be sown it can be done by hand in very shallow plough furrows—not more than  $1\frac{1}{2}$  in. deep.

#### CULTIVATION.

Soon after the plants have germinated, and the rows are distinctly visible, the land between the rows should be cultivated with a horse-hoe, to loosen the surface and kill weeds which may have germinated. When the plants are about 6in. high, they should be thinned out, so that the remaining ones are from 8in. to 12in. apart in the rows. Throughout the growth of the crop the land between the rows should be kept well worked with a cultivator; at no time should a surface crust or weeds be allowed to exist.

The price received for the crop will depend to some extent on the straightness of the fibres in the individual heads, and as in some seasons many heads are inclined to become bent and twisted if left standing upright, it is a fairly common practice, and a wise one, to bend the heads over. This is done a short time after flowering, by bending the head downwards at a point about 1ft. below the head, and this hanging down of the heads keeps the fibres well together and straight.

The article required by broommakers is one in which the fibres are long, straight, tough, and with a green tinge. The first of these requirements is secured by getting good and regular growth; the second by bending down the heads, although this work is not always necessary to get straight fibres; and the last two—toughness and greenness—by care in harvesting and drying the crop. As a general rule, the crop should be harvested when the seed is in the "dough" stage, *i.e.*, firm and not milky, but soft enough to be able to cut the kernel through with the fingernail.

#### HARVESTING.

Harvesting is done with a strong knife or pruning shears by cutting off the heads with about 6in. to 10in. of stalk adhering to them. If the heads are to be dried in the field, it is usual to cut the whole stalks, or bend them over so that the soil is covered with them, and the cut heads are then laid on these stalks. In this way it will take about two days to dry out the heads; but during the drying the heads must not be allowed to get damp, and if rain comes they must be heaped

and covered, and this must also be done if dews are likely to be heavy. Wetting at this stage leads to discoloration of the fibres, with a resulting reduction in price. Best drying results are secured by only allowing the heads to remain for a couple of hours in the field after having been cut, then carting to a shed, and packing in layers about 3in. deep on wire-netting covered racks. They will take longer to dry in this way, and must be repeatedly turned to prevent sweating.

When properly dry, the seed is removed from the heads by a machine known as a hackler. As this machine only consists of a roller with short iron pegs, which travels at a high speed, it is comparatively cheap; but if the area grown does not warrant the purchasing of one, a home-made hackler will do the work, or the heads can be dragged by hand over a nail-studded board. After the removal of the seed, the heads of fibre should be graded into types needed by the broom-makers, and baled separately, ready for transport.

#### PROSPECTIVE RETURNS.

The price of this article varies so much that it is extremely difficult to even guess at the possible returns, but the price of a well-grown, well-cured article should average £25 a ton, with variations between £15 and £40 odd, and you should be able to average 12cwts. to 15cwts. of baled heads per acre. The seed obtained will make a useful addition to your grains for feeding livestock, but in the market will not be worth much more than 1s. a bushel, because it will be immature.

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## BLACK SPOT OF THE VINE.

A vinegrower on one of the River Murray settlements wrote to the Consulting Botanist and Vegetable Pathologist (Professor T. G. B. Osborn, D.Sc.) mentioning that a claim had been made that spraying with a mixture of 1gall. of a proprietary copper solution, 5galls. to 6galls. red oil, and 100galls. water would do away with the need for swabbing as a winter treatment for black spot. The solution was to be sprayed on to the vines directly the buds began to move, and subsequently in the proportions 1, 1, 100, as required, according to weather. The grower reported that it was claimed that whilst acid would certainly kill the black spot, it would injure the vine. Copper, it was mentioned, was a great cleanser, and, mixed with oil, penetrated and spread over the leaves, &c. At the same time, the oil would kill the red spider and other insect pests. "It sounds too good to be true," the correspondent says, and proceeds to ask whether it is advisable for him "to stick to the old system rather than risk something comparatively unknown." In advising the grower, Professor Osborn mentioned, *inter alia*, that the generalisation that copper was the fungicide, *par excellence*, was correct, but that applied to the treatment of actively growing fungi, not of parasites in their winter state. "In the treatment of anthraenose or black spot of the vine, copper solutions may be useful when the fungus is growing actively, but not when it is resting during the winter in the cankers that it has formed on the canes," the Pathologist continues. "A stronger and more penetrating poison is then necessary to reach and kill the dormant fungus mycelium. This is why the choice has fallen upon sulphuric acid, or more usually sulphuric acid and iron sulphate in solution. Ideally, the use of a knife to excise the whole disease spot or lesion, followed by a disinfectant to clean up the wound which would then be closed by tar, might be the treatment for many black spot cankers. But such a treatment is impracticable, on the ground of expense and labor, and the quicker method of swabbing the diseased spot with a strong poison is adopted in the attempt to cauterise the wound, as it were, and kills the fungus, which in its resting state is very resistant to weaker poisons.

"I do not quite appreciate the purpose of red oil in the treatment of black spot. It is not a fungicide, and though its presence as an emulsion in the spray might conceivably help the solution to spread more evenly, the mischief with black spot is to a great extent done if one waits till the growing season for the vine—and the fungus—to open. If that is done, the resting cankers become open and mature a large crop of spores, unhindered by winter treatment. The whole purpose underlying the winter treatment of black spot is to attack the disease whilst it is inactive.

"Spring and summer treatment, by means of sprays, may be beneficial, as a supplementary measure, and in this respect I feel sure that the spraying with Bordeaux or Burgundy mixtures against downy mildew will also check black spot; but it is not efficacious as winter treatment of the latter disease. Unfortunately, the downy mildew fungus cannot be reached during the winter, but the black spot organism, fortunately, can. By all means, therefore, do so. It is the surest way of nailing the enemy, for you thus have it confined to a comparatively few spots, not blowing about by the wind in the form of millions of highly active infective spores.

"I could not, therefore, recommend anyone to omit swabbing for black spot during the winter. Use such a standard remedy as sulphuric acid, 8lbs.; iron sulphate, 35lbs.; water, 10galls., and rub it into the lesions, even if you do not spray the whole vine."

## MURRAY BRIDGE HERD TESTING SOCIETY.

### RESULTS OF BUTTERFAT TESTS FOR APRIL, 1921.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during April.	Per Cow during April.	Per Cow October to April.	Per Herd during April.	Per Cow during April.	Per Cow October to April.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/A	11-60	11-40	7,410	638-79	3,761-90	375-17	32-34	173-80
1/B	14	14	5,741	410-07	4,309-08	293-46	20-96	190-53
1/C	45	35-53	22,853	507-84	3,811-39	961-72	21-37	152-53
1/D	21	15-90	10,545	502-14	3,061-36	540-05	25-72	149-20
1/E	14-33	13-43	8,007	558-63	3,751-33	387-22	27-02	178-21
1/F	11	11	4,185	380-45	3,738-77	186-59	16-96	152-27
1/G	48	44-60	42,490	885-21	5,637-13	1,693-43	35-28	211-90
1/H	13	11	6,165	474-23	3,455-86	277-90	21-38	143-00
1/I	10-60	10	5,298	499-81	4,462-74	266-73	25-16	184-98
1/J	16-63	14-90	9,400-5	550-02	4,589-70	442-16	26-46	203-37
1/K	13-90	12-40	8,535	614-03	3,757-45	390-12	28-07	162-17
1/L	13	10	5,205	400-39	3,781-57	252-27	19-41	169-99
1/M	16-83	15-60	6,072	380-71	2,856-18	304-64	18-10	132-20
1/N	—	—	—	—	—	—	—	—
1/O	28	18-33	10,461-5	373-63	2,317-28*	474-22	16-94	105-93*
1/P	19-40	16-53	8,549-5	440-70	2,366-13*	407-74	21-02	102-55*
1/Q	—	—	—	—	—	—	—	—
Means	19-75	16-97	10,727-83	543-11	3,927-27†	483-56	24-48	169-93†

\* For five months only.

† Excluding herds O and P.



## ORCHARD NOTES FOR AUGUST FOR THE SOUTHERN DISTRICTS.

[By C. H. BEAUMONT, Orchard Inspector and Instructor,  
Southern District.]

Pruning should be completed. All cuttings collected and burned, especially cuttings from trees or vines known to be diseased.

The first ploughing should also have been completed. Hoe about trees and vines close to main stems.

To prevent or lessen anthracnose of the grape vine, clear off all dead bark and burn it. Thoroughly swab limbs, spurs, and rods with a solution composed of sulphuric acid and iron sulphate in the following proportions:—Place 35lbs. or 50lbs. of iron sulphate in a wooden tub; pour on to it 3lbs. to 5lbs. of commercial sulphuric acid; then add 11galls. of boiling water. Keep clear of splashes, as the liquid is very corrosive. Another solution used with success is made by adding 10lbs. of commercial sulphuric acid to 9galls. of water. Use a wooden vessel, add acid slowly; the mixture will be hot. The first application is given at midwinter; the second about 14 days before the buds are expected to open. The swab is most effective, but a spray pump may be used, if lead lined, or the liquid be placed in a wooden vessel, with external pump fixed.

See that your spray pump and all accessories are in proper working order. If you have not arranged a mixing station do so; it will save a lot of time and cost at spraying time.

Remember, that to prevent most of the fungus troubles that affect our trees and vines, spraying with Bordeaux mixture is necessary, just before the buds burst. Be ready. Full instructions may be obtained at the office or from the instructor.

Be prepared for planting out citrus trees next month.

## ORCHARD NOTES FOR THE NORTHERN DISTRICTS.

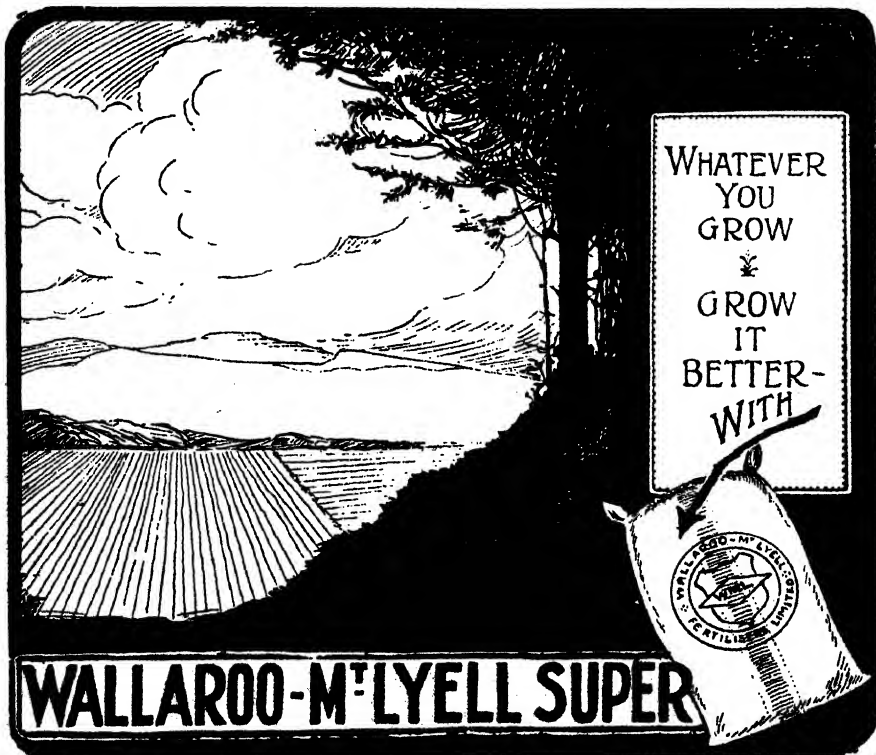
[By J. B. HARRIS, Orchard Instructor and Inspector.]

Woolly aphis (*Schizoneura lanigera*) is at present more than usually prevalent in parts of the district. The best means of combating this pest, on a large scale, is by thorough and forceful spraying with red oil or kerosine emulsions. A controversy exists as to the best time to spray—before or after pruning. Unless prunings are immediately burned, I advocate spraying before pruning as the insects can live on prunings for some days at least after they are severed from the tree, and may be a source of infection to other trees.

Spraying after pruning protects the cut surfaces, which are most vulnerable spots. Where the attack is bad and financial considerations warrant the procedure, spraying in early and late winter, before and after pruning, may be practised. A nicotine preparation, known as "Black Leaf 40" is, when obtainable, a valuable spray, when diluted, for summer use against this pest.

One of the lesser known fungoid diseases (*Puccinia pruni*), or prune rust, has been prevalent during the past season, and, in one case, entirely defoliated a large number of prune trees just as the fruit was ripening. This is the disease which is frequently alluded to as "fire blight."

Almonds have been badly attacked, and being usually unsprayed, serve to perpetuate the disease. All stone fruits are attacked, and, where the disease is feared during the coming season, I would suggest the spraying of all stone fruits and almonds with the customary spring spray of Bordeaux or Burgundy mixture. In the event of a wet season, more than one spraying may be necessary to keep the disease in check.



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## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held on Wednesday, July 13th, there being present Mr. C. J. Tuckwell (Chairman), Messrs. W. J. Colebatch, F. Coleman, W. S. Kelly, A. M. Dawkins, T. H. Williams (Chief Inspector of Stock), and the Secretary (Mr. H. J. Finnis). Apologies were received from Professor Arthur J. Perkins, Mr. George Jeffrey, and Captain S. A. White.

*Election of Officers.*—Mr. C. J. Tuckwell was re-elected Chairman and Mr. W. S. Kelly Vice-Chairman.

*Personal Residence Clause in Closer Settlement Leases.*—In response to a request from the recent Conference of South-Eastern Branches, "That the Government be asked to enforce the personal residence clause on all closer settlement lands," the Commissioner of Crown Lands intimated that it was the practice of the Department to, so far as practicable, enforce the personal residence clauses, particularly on closer settlement lands. A petition asking that covenants for personal residence might be enforced on the Kongorong blocks had been received through the members of the district, and was being dealt with. A large number of agreements in respect of this estate do not contain a covenant for personal residence. It was decided to forward a copy of the report to the Branches concerned.

*Testing Fencing Timber.*—In reply to a request from the Petina Branch of the Bureau, that a trial be conducted at the Minnipa Experimental Farm, to ascertain the life of different timbers grown on Eyre's Peninsula for fencing posts, the Superintendent of Experiments stated that:—"We can easily test the life of the timbers of Eyre's Peninsula as fencing posts, providing we can secure the posts, and I would suggest that the Petina Branch of the Bureau be asked to supply a list of the timbers worth testing, and where they are growing, for until we have that information, we cannot arrive at the possible cost to us of obtaining the timber." On the motion of Mr. Coleman, it was decided that the Petina Branch might be asked to supply the required information.

*Standard Measures for Weighing Wheat.*—This matter was again brought before the Board, and the following report read from the Director of Agriculture:—"I have made a careful inquiry into the methods usually adopted by local buyers and their agents, to determine the bushel weight of wheat offered for sale, and I have come to the conclusion that these methods are not only inadequate, but, from the seller's, or farmer's, point of view, wholly unsatisfactory. In this connection I secured from the Wheat Harvest Board a wheat tester in current use by officers of this body. This tester was forwarded to the Director of Chemistry, with a request that it be carefully tested for accuracy. Dr. Hargreaves's report on the subject is shown in D.A. 449/21. In his report, Dr. Hargreaves points out that not only were the scales themselves inaccurate, but that, even when corrected, the results registered depended wholly on the mechanical

manipulations of whoever was handling them. Hence, from the point of view of the seller, who is a mere 'onlooker,' two points are essential to his protection:—

- (1) That whatever tester is used be stamped as accurate by some duly constituted body.
- (2) That special rules be drawn out for the guidance of whoever makes use of the tester.

"This question was referred to the Crown Solicitor for his opinion as to whether wheat testers could be brought under the local Weights and Measures Act of 1885. Dr. Richards is of the opinion that it would be more appropriate to provide for wheat standards by special legislation.

"In conclusion, therefore, if sellers are to be adequately protected against the carelessness, or incompetence, or even possible intention to defraud, of agents, it would appear that legislation would be needed to fix the following points:—

- (1) What shall be the standard type of instrument to determine a bushel weight of wheat.
- (2) The establishing of some authority to test and stamp all instruments in use, as accurate.
- (3) To draw up a scale of rules, indicating in what manner the tester should be filled and generally used."

It was decided, on the motion of Mr. Dawkins, that the Government be asked to act on the recommendations made by the Director.

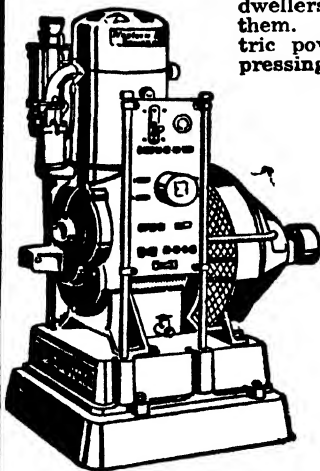
*Compulsory Spraying of Orchards.*—In reporting on a resolution from the River Murray Branches Conference, urging that the spraying of fruit trees and vines be made compulsory, that a salaried officer be appointed to supervise the work, and that legislation be introduced to allow of the formation of local boards to control operations, the Horticultural Instructor (Mr. G. Quinn) said:—"The position in relation to these matters, as it stands at present, is as follows:—

(1) The legal aspect: Apples, pears, and quinces—The law provides these trees must be sprayed against codlin moth whenever an inspector discovers this pest in them, and notifies the occupier or owner to spray them. Grape vines—In so far as "black spot" is concerned, regulations exist, and an inspector may notify the owner or occupier of land carrying infected vines to swab, or spray, or both, as he deems necessary. Downy Mildew—To enforce spraying against this fungus, it will first be necessary to proclaim it a disease within the meaning of the Vine, Fruit, and Vegetable Protection Acts, and formulate and proclaim by regulation the steps to be enforced for its destruction. When this is done, an inspector may order growers in whose vines this fungus is found—but not otherwise—to take the precautions prescribed. Local boards—Fresh legislation would be necessary to empower the appointment or election of boards to supervise such work. My personal opinion is that such boards are not likely to prove a success, as the distribution of duty and authority does not make for efficient supervision. The supervision would probably be spasmodic, and the element of local interest—disinclination to act in an unneighborly manner towards neglectors, on the one hand, or bias or harshness, on the other, could have free play. I am of the opinion only a



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salaries officer or officers, responsible to an outside authority, would be likely to carry out the duties without fear or favor. If it be decided that compulsory treatment is essential for these diseases in the Murray Valley, then one or more full-timed inspectors should be paid to supervise same. The unfortunate position which exists under our present legislation makes no provision for punishing the recalcitrant grower, other than by destroying the offending trees or vines, or treating them officially, and suing afterwards to recover the cost. The first-named is scarcely desirable of adoption in the case of valuable but neglected trees or vines, and the latter, owing to the need for simultaneous action, becomes a physical impossibility when the neglected plantations are at all numerous or widespread." On the motion of Mr. Colebatch, it was decided to ask the other fruitgrowing districts for an expression of opinion on the resolution of the River Murray Branches, and the comment thereon by Mr. Quinn.

*Forest Reserve, Glencoe District.*—The Glencoe Branch of the Bureau asked that an area of land adjoining the main road between Glencoe and Mount Gambier be purchased by the Government for the planting of timber. The Board decided to send the matter on to the Forestry Department, with a request that they furnish a report on the matter.

*Extension of Area under Irrigation, Moorook.*—The Moorook Branch of the Agricultural Bureau intimated that they viewed with concern the proposed extension of the Moorook irrigation settlement, on the grounds that the greater part of the land was unsuitable for the purpose. On the motion of Mr. Dawkins, seconded by Mr. Coleman, it was resolved to seek a report from the Director of Irrigation.

*Weighing Stumps by Railways Department.*—A communication was received from the Coonalpyn Branch of the Bureau, suggesting that the weights of trucks carrying roots should be checked for a certain period at Mile End. Mr. Dawkins moved that the matter be sent on to the Railways Commissioner, with an intimation to the effect that as railway bridges were at times the only means the settlers had of ascertaining the weight of truckloads of roots, it was desirable that the weighing should be correctly done.

*Reference Library, Renmark.*—A communication was received from the Renmark Branch of the Bureau to the effect that they were desirous of establishing a reference library in connection with the local Branch of the Bureau, to consist of the *Agricultural Journals* of all the States of the Commonwealth, and a set of the bulletins issued by the Department of Agriculture in each State, and seeking assistance from the Board. The Board decided, on the motion of Mr. Colebatch, to compliment the Branch on the move it had made in this matter; also to supply the Branch with copies of publications issued by the Department of Agriculture in this State, and suggest that they be asked to apply direct to the other States for copies of their issues. If the Branch was unsuccessful in obtaining these, the Advisory Board would take steps to obtain the publications for them.

*Circulating Library.*—A resolution was received from the Rockwood Branch of the Bureau as follows:—"That the Advisory Board be

asked to recommend the Department of Agriculture to establish a circulating library of books on agriculture, stock breeding, feeding, horticulture, *Journals of Agriculture* of other States, and other suitable literature." Mr. W. S. Kelly and the Secretary were asked to draw up a scheme for the consideration of the next meeting.

*Publishing Price of Produce in Press.*—The Shoal Bay Branch requested that the Government be asked to publish official quotations in the press each day of the prices of all farmers' produce, wool sacks, corn sacks, twine, and all commodities that would be of interest to farmers generally. The Board was of the opinion that such action was unnecessary.

*Introduction of Harmful Weed Seeds.*—The Lucindale Branch forwarded a resolution to the effect that seeds of harmful weeds were being introduced into districts mixed with fodder seeds, especially Sudan grass seed. Mr. Dawkins moved, and Mr. Coleman seconded, that the Government be asked to expedite the passage of a Pure Seeds Bill through Parliament. Carried.

*Qualification Certificates: Returned Soldiers.*—A communication was received from Barmera in regard to returned soldiers working under the Irrigation Department as daily paid employees, not being eligible for a qualification certificate after working 12 months. The Board decided that the matter did not come within their scope, and decided to refer the matter to the Minister of Repatriation.

*New Branches.*—New Branches were formed in the following centres:—Rendelsham, Winkie, and Balhannah, with the following gentlemen as members:—Rendelsham—Messrs. R. Foster, E. E. Stewart, H. A. Stewart, V. A. Smith, W. A. Farmer, J. I. Crisp, J. J. Nash, M. Guerin, C. Buhlman, A. Johanson, V. Bignell, R. Clark, T. Humphries, A. G. Ballard, S. M. Smith, C. J. Nilson, F. Nilson, A. Poole, C. H. Poole, S. Galway, T. E. Carther, S. Carther, F. Todd, C. Schinckel, B. Ballard. Winkie—Messrs. F. Burgess, P. Buzacott, L. Buzacott, G. W. Bullpitt, W. E. Bullpitt, F. D. Bullpitt, H. McR. Dalziel, C. Rumball, W. M. Dann, G. W. Sibbick, G. C. Naley, A. M. Wright, M. L. Cockshell, J. M. Cockshell, K. G. Ross, C. K. Brand, A. V. Possingham, A. M. Farley, G. W. Napier, L. L. Brugeand, A. Nicol, S. T. Gran, S. H. Fernee, H. Colby, C. G. Ralph, J. Sterratt, H. D. Herriott, A. Setterberg, C. Plush, W. Hollands, A. W. Davis, C. H. Davis, C. Koll, R. E. Fluris, F. W. A. Bond, P. R. Setterberg, W. O. Rogers, A. A. Goodwin, C. W. Tuckfield, K. N. LeCornu, C. P. McDonald, H. Schroeder, J. A. Possingham. Balhannah—H. N. Wicks, H. C. Pitt, sen., H. C. Pitt, jun., H. James, sen., H. James, jun., F. Mount, J. C. Grasby, J. Blessing, R. Kelsey, A. Kelsey, C. Wenzel, R. West, E. Mattner, A. H. Spoehr, H. A. Spoehr, F. Kloeden, A. Filsell, V. Spoehr, G. Witte, S. White.

The Port Pirie, Sherlock, and Woodside Branches of the Agricultural Bureau were closed.

*Life Members.*—The following gentlemen were approved as life members of the Agricultural Bureau:—Hon. W. Hannaford, M.L.C., Mr. W. D. Davis, and Mr. J. W. Kelly, all being members of the Riverton Branch.

*New Members.*—The following names were added to the rolls of existing Branches:—Kilkerran—A. Sawade; Pinnaroo—R. Pritchard; Glossop—Bott, R. Priest; Ironbank—G. Pole; Parilla Well—G. A. Schultz; Kalangadoo—R. J. Messenger, J. Allechin, E. V. Bennett, L. G. Dean; Glencoe—P. Millowick, A. Tregenza; McLachlan—H. Mavis, J. L. Norman; Morehard—R. T. Fabbian; Yacka—I. Jenkins, S. H. Harvey; Beetaloo Valley—F. Bartrum; Booleroo Centre—D. D. Smith, C. Innis; Lone Gum—E. R. Whitelaw; Murray Bridge—J. Venning; Willowie—F. G. Blight, J. Tilbrook, L. Tilbrook; Mundalla—H. Warland; Alawoona—H. Andrews, J. Whiting, C. Lonnar, C. P. George; Arthurlton—W. Colliver; Two Wells—W. B. Williams; Ironbank—L. Morgan; Meadows—W. H. Thomas; Rose-dale—H. Koch, E. Koch; Miltalie—W. H. Wheeler; Roberts and Verran—H. A. Simmons; Barmora—W. H. James, R. G. Hallam, H. Sando, H. C. Gittins, A. H. Baynes, E. Patton; Williamstown—J. J. Philp, C. G. Fromm; Rockwood—S. Collett, E. R. Heath, C. F. Rogers, J. H. Simmons; Ashbourne—E. Pitt, G. Pitt; Bute—W. G. Fidge, jun.; Ramco—E. Rohrlach, E. Milen; Blyth—M. O'Malley; Coonawarra—W. Snelling, W. McLean; Lameroo—L. E. Crispe, W. B. Crispe; Renmark—J. McGregor, E. H. Cornish, W. B. Creer, L. Vowser, G. Hamister; Morphett Vale—S. H. Marshall; Black Springs—J. Heinrich, H. Wardle; Younghusband—F. Macrow; Moonta—J. Warmington, E. C. Atkinson; Orreroo—A. C. Moody, W. Toop, sen.; Butler—J. G. S. Moran; Maitland—A. W. Kelly; Minnipa—R. P. B. Viser, R. Hill, J. Daly, P. C. Boylan, W. Head, E. W. Grubb; Glencoe—R. A. J. Sinclair; Lone Pine—T. Koch, V. Schmidt, P. Gabel, C. Spaeth, C. Baum, H. Hoyle; Naracoorte—J. L. Nagel; Wynarka—T. J. Ninnas.

Mr. T. H. Williams drew the attention of the members to the Bathurst burr, and was of the opinion that some steps should be taken by the Government to check the pest. The burr became embedded in the wool of sheep, and the seeds were carried throughout the different localities.

## FARMERS' CO-OPERATIVE EXECUTORS AND TRUSTEES, LIMITED.

### DIRECTORS:

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A. B. DURDIN, MANAGER.



## EGG-LAYING COMPETITION, 1921-1922.

HELD AT THE PARAFIELD POULTRY STATION, PARAFIELD, UNDER THE DIRECTION  
OF D. F. LAURIE (GOVERNMENT POULTRY EXPERT AND LECTURER).

Total No. of Pens.—Section I., Light Breeds (Single Testing), 24—3 pullets in each entry. Section II., Heavy Breeds (Single Testing), 13—3 pullets in each entry. Section III., Light Breeds, 25—3 pullets in each pen. Section IV., Heavy Breeds, 9—6 pullets in each pen.

TWELVE MONTHS' TEST. TO START ON MARCH 1st, 1921, AND TO TERMINATE ON FEBRUARY 28TH, 1922.

## SECTION I.—LIGHT BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENTRY.

Row No.	Name and Address.	Bird No.	Month ending 31/7/21.	Score to Date.	Bird No.	Month ending 31/7/21.	Score to Date.	Bird No.	Month ending 31/7/21.	Score to Date.
WHITE LEGHORNS.										
E	Bamford, W. H., 74, Adelaide Road, Glenelg	1	22	84	2	23	81	3	—	48
E	Connor, D. C., Gawler	4	7	46	5	19	53	6	17	75
E	Willington, Mrs. G., Milang	7	2	69	8	4	25	9	22	67
E	Nancarrow, J. T., Plympton	10	11	21	11	19	33	12	4	50
E	Broadview Poultry Farm, Seaton Park	13	18	53	14	10	44	15	9	40
E	Stevens, H. J., Broken Hill	16	15	28	17	3	29	18	8	53
E	Monkhouse, A. J., Woodside	19	7	29	20	20	50	21	22	76
E	Turvey, D. J., Milang	22	23	24	23	15	15	24	11	11
E	Lampert, Mrs. S., Piccadilly	25	14	40	26	18	33	27	13	13
E	Nancarrow, J. T., Plympton	28	22	47	29	18	50	30	10	40
E	Small, E. W., Mount Gambier	31	21	40	32	15	45	33	6	26
E	Coleman, A. C., Grange	34	13	32	35	—	—	36	15	49
E	Broadview Poultry Farm, Seaton Park	37	16	57	38	8	43	39	—	35
E	Holmes, F. A., Naracoorte	40	12	29	41	14	33	42	22	40
E	Lampert, Mrs. S., Piccadilly	43	19	75	44	16	23	45	21	36
E	Green, F. W. H., Monteith	46	19	32	47	23	60	48	12	32
E	Howie, H. H., Mount Gambier	49	7	41	50	9	40	51	9	40
E	Willmott, H. J., Clarence Park	52	11	25	53	15	16	54	—	4
E	Stockman, A., Goodwood	55	—	44	56	—	1	57	17	25
E	Green, A. J., Crystal Brook	58	22	58	59	11	45	60	15	56
E	Herbert, C., Alberton	61	10	23	62	14	43	63	11	41
E	Blake, Mrs. B. L., Berowra, N.S.W.	64	15	63	65	10	58	66	2	45
F	Tilly, P. N., Balwyn, Victoria	1	3	45	2	—	45	3	—	29
F	Dugan, T., Wingfield Rifle Range, Port Adelaide	4	20	82	5	21	75	6	22	83
	Totals	—	329	1,087	—	305	940	—	288	1,014

## SECTION 2.—HEAVY BREED (SINGLE TESTING). THREE PULLETS EACH ENTRY.

## BLACK ORPINGTONS.

F	Lampert, Mrs. S., Piccadilly	7	25	72	8	12	56	9	19	90
F	Shaw, R. R., Crystal Brook	10	21	25	11	23	34	12	14	46
F	Farr, K. H., Fullarton Estate	13	21	87	14	21	88	15	19	58
F	Alford, T., Broken Hill	16	20	113	17	24	89	18	30	119
F	Lampert, Mrs. S., Piccadilly	19	27	76	20	23	96	21	—	—
F	Holmes, F. A., Naracoorte	22	21	30	23	20	49	24	23	44
F	Shaw, R. R., Crystal Brook	25	19	27	26	15	26	27	14	14
F	Wheaton, S. P., Bute	28	26	50	29	11	24	30	9	16
F	Bansemmer, Mrs. B., Beaumont	31	25	86	32	27	105	33	5	51
F	Farr, K. H., Fullarton Estate	34	25	101	35	21	94	36	21	105
F	Mortimer, G., Broken Hill	37	24	92	38	8	82	39	23	77

**SECTION 2.—HEAVY BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENTRY.**

Row No.	Name and Address.	Bird No.	Month ending 31/7/21.	Score to Date.	Bird No.	Month ending 31/7/21.	Score to Date.	Bird No.	Month ending 31/7/21.	Score to Date.
<b>RHODE ISLAND REDS.</b>										
F	Stockman, A., Goodwood .....	40	22	74	41	7	36	42	11	25
F	Tester, G., Naracoorte .....	43	23	57	44	15	15	45	4	4
	<b>Totals .....</b>	—	299	890	—	227	794	—	192	649

**SECTION 3.—LIGHT BREEDS (PEN TESTS). SIX PULLETS IN EACH PEN.**

Pen No.	Name and Address.	Breed.	Eggs Laid for Month Ending 31/7/21.	Total Eggs Laid from 1/3/21 to 31/7/21.
1	Anderson, S., Gawler Railway .....	White Leghorns .....	100	380
2	Pugsley, A., Hindmarsh .....	" .....	39	223†
3	Connor, D. C., Gawler .....	" .....	95	282
4	Willington, Mrs. G., Milang .....	" .....	88	248
5	Norton Bros., Seaton Park .....	" .....	51	229
6	Nancarrow, J. T., Plympton .....	" .....	77	182
7	Small, E. W., Mount Gambier .....	" .....	103	300
8	Buchan, J. S., Seaton Park .....	" .....	117	364
9	Anderson, J., Prospect .....	" .....	76	182
10	Pugsley, A., Hindmarsh .....	" .....	54	220
11	Alford, T., Broken Hill .....	" .....	96	287
12	Pool, F. J., North Norwood .....	" .....	65	197
13	Nancarrow, J. T., Plympton .....	" .....	98	324
14	Smith & Gwynne, Gawler South .....	" .....	102	295
15	Ratten, C. A., Mile End .....	" .....	100	340
16	Howie, H. H., Mount Gambier .....	" .....	97	387
17	Willmott, H. J., Clarence Park .....	" .....	56	178
18	Anderson, Wm., Kapunda .....	" .....	77	351
19	Herbert, C., Alberton .....	" .....	66	270
20	Sparrow, F. H. L., Beverley .....	" .....	90	375
21	Clee Hill Stud Poultry Farm, Box Hill, Victoria .....	" .....	96	302
22	Beythein, E. W., Scott's Creek .....	" .....	110	236
23	Provis & Sons, W., Tumby Bay .....	" .....	115	315
24	Dugan, T., Wingfield Rifle Range, Port Adelaide .....	" .....	93	284
25	Bansemer, Mrs. B., Beaumont .....	" .....	124	439
	<b>Totals .....</b>		2,194	7,190

**SECTION 4.—HEAVY BREEDS (PEN TEST). SIX PULLETS EACH ENTRY.**

26	Lampert, Mrs. S., Piccadilly .....	Black Orpingtons .....	65	303
27	Farr, K. H., Fullarton Estate .....	" .....	99	306
28	Bansemer, Mrs. B., Beaumont .....	" .....	—	—
29	Farr, K. H., Fullarton Estate .....	" .....	119	399
30	Lampert, Mrs. S., Piccadilly .....	" .....	127	490
31	Alford, T., Broken Hill .....	" .....	121	279
32	Clee Hill Stud Poultry Farm, Box Hill, Victoria .....	" .....	121	514
33	Lampert, Mrs. S., Piccadilly .....	" .....	130	606
34	Ryan, Jas., Coburg, Victoria .....	Rhode Island Reds ..	125	560
	<b>Totals .....</b>		907	3,457

† One bird dead.

## DIVISION B.—STANDARD BREEDS ONLY.

19 Pens each of 6 Birds—114 Birds.

COMMENCING APRIL 1ST, 1921. TERMINATES FEBRUARY 28TH, 1922.

Pen No.	Name and Address.	Breed.	Eggs Laid for Month Ending 31/7/21.	Total Eggs Laid from 1/4/21 to 31/7/21.
37	*Lampert, Mrs. S., Piccadilly .....	White Leghorns.....	—	—
38	*Newcombe, E. G., Alberton .....	" .....	—	—
39	Packham, C. D., Kensington Park...	" .....	80	185
40	*Beythien, E. W., Scott's Creek.....	" .....	—	—
42	Packham, C. D., Kensington Park...	" .....	62	192
43	*Newcombe, E. G., Alberton .....	" .....	—	—
44	Belmont Orpington Yards, Evandale.	Black Orpington .....	119	271
45	*Lampert, Mrs. S., Piccadilly .....	" .....	—	—
46	*Farr, K. H., Fullarton Estate.....	" .....	—	—
47	Bansemmer, Mrs. B., Beaumont .....	" .....	110	336
48	Addison, Mrs. A. L., Malvern .....	Rhode Island Red....	80	214
49	*Beer, A. C., Gilberton .....	" .....	—	—
50	Hill, H. V., West Adelaide .....	" .....	102	225
51	*Beer, A. C., Gilberton .....	" .....	—	—
52	Perkins, C. W., North Norwood .....	Silver Wyandotte .....	94	282
53	Addison, A. L., Malvern .....	White Wyandotte .....	91	171
54	Bagshaw, W. E., Hermitage .....	White Rocks .....	53	241
55	Bagshaw, W. E., Hermitage .....	Barred Rocks.....	58	133
Totals .....			849	2,250

\* Not in accordance with standard.

**"Poultry Don't Pay"—Why?**

Simply because you have not got the right sort. Follow the advice of the late Admiral Fisher—"Scrap (Sack) the lot"—and commence afresh this season.

Write immediately to **NORTON BROS.** for full particulars regarding their wonderful White Leghorn real live egg machines.

*Under the personal supervision of the Government Poultry Expert (Mr. D. F. Laurie).*

**Postal Address—P.O., SEATON PARK.**

**'PHONE, 338 HENLEY.**

**DAIRY AND FARM PRODUCE MARKETS.**

A. W. Sandford & Co., Limited, reported on August 1st, 1921:—

**BUTTER.**—It is pleasing to report that the production of butter during the month continued to increase each week, so that we not only had supplies enough for local requirements, but also had a surplus for export. Values firmed owing to keen interstate demand, and also in sympathy with the London market, where values have hardened considerably. At the close of the month values were:—First-grade factory and creamery in prints, 1s. 8½d. to 1s. 9d.; best separators and dairies, 1s. 6d. to 1s. 7½d.; fair quality, 1s. 4d. to 1s. 5d.; store and collectors', 1s. 3d. to 1s. 4d.

**EGGS.**—Values have declined rapidly, as was only to be expected with increasing supplies. Fresh hen sold at the end of the month at 1s.; duck, 1s. 1d.

**CHEESE.**—This also eased in values, but market is firm at rates now quoted, viz., 10½d. to 11d. for large to loaf.

**HONEY.**—Heavy quantities have come to hand during the past month, but demand has somewhat slackened, and sales are a little slow at present rates. Prime clear extracted selling at 5d.; second grade, 3d. to 3½d. Beeswax, 1s. 7d.

**ALMONDS** are meeting with ready sale at enhanced prices, Brandis selling at 10½d. to 11d.; mixed softshells, 9½d. to 10d.; hardshells, 4d. to 4½d.; kernels, 1s. 10d.

**BACON.**—In sympathy with the firming in rates of the live animal reported last month, bacon values have shown an improvement in price, with good demand. Best factory-cured sides, 1s. 3½d. to 1s. 4d.; hams, 1s. 4d. to 1s. 5d.; lard in packets, 8½d.; bulk, 8d.

**LIVE POULTRY.**—Supplies have kept up well, and spirited competition has been the rule in our rooms, the rates at our last auction being:—Prime roosters, 4s. to 6s. each; nice-conditioned cockerels, 3s. 3d. to 3s. 11d. each; plump hens, 3s. 9d. to 5s. 6d. each; light birds, 2s. 9d. to 3s. 6d. each, only poor and weedy sorts selling lower; ducks, 3s. 2d. to 5s. 9d. each; geese, 7s. 6d. to 8s. 6d. each; turkeys, prime conditioned, 10½d. to 1s. 2d. per lb. live weight; fair conditioned, 8½d. to 10d. per lb; fattening sorts lower; pigeons, 8½d. to 10½d.

**POTATOES.**—During the month supplies of Victorian potatoes have been principally filling the demand, although there is still a small percentage of locals being marketed. Values at the end of the month were:—Victorian Snowflakes, from £6 15s. to £7 5s.; Carmens, £7 5s. to £8 5s., on trucks Mile End.

**ONIONS.**—£5 to £6 10s. on rails, Mile End.

**IMPORTS AND EXPORTS OF FRESH FRUIT, &c.**

*Referring to the return for May, 1921:—*

Under the Federal Commerce Act, 728 packages of fresh fruit, 12,093 packages of dried fruit, 1 package of jam, and 5 packages of plants were exported to oversea markets. These were consigned as follows:—To London, 12,008 packages of dried fruit, 1 package of jam, 25 packages of apples.

*Should read:—*

Under the Federal Commerce Act, 728 packages of fresh fruit, 11,793 packages of dried fruit, 300 packages of preserved fruit, 1 package of jam, and 5 packages of plants were exported to oversea markets. These were consigned as follows:—To London, 11,708 packages of dried fruit, 300 packages of preserved fruit, 1 package of jam, and 25 packages of apples.

# **DAMAGED WHEAT**

**I AM A BUYER OF DAMAGED WHEAT, UNDER LICENCE  
FROM THE WHEAT BOARD, AND PAY**

**HIGHEST CURRENT PRICES.**

**ALSO,**

**Good Quality Barley.**

**Farmers, send Samples and particulars as to quantities to**

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**(LATE MANAGER WHEAT SCHEME),**

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They have never been equalled for Power, Economy, and Long Life. They have six public records to their credit. They give twice the power for the rating of any imported tractor, and, power for power, they are only half the cost of imported machines. There is nothing capable of competing with them on kerosene for cheapness of running or for ease of manipulation, and on crude oil they add to this advantage by reducing by more than half their running costs on kerosene.

Our SUCTION GAS PLANTS, using wood fuel, are marvels of economy. All sizes obtainable from 8 h.p. to 100 h.p.

**USERS OF POWER SHOULD WRITE FOR PARTICULARS.**

## THE AGRICULTURAL OUTLOOK.

### REPORTS FOR THE MONTH OF JULY.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

*Booborowie.*—Weather—Two hundred and twelve points of rain have been registered for the month up to the time of writing. Severe frosts in the early part, followed by hurricane winds, with good rains during the latter part, is a general description of the weather for the month. Crops—These are looking healthy, and excepting fields sown before the rain which fell late in May, very little growth has been made, but slow growth during June and July is characteristic of this locality. Natural feed—There is plenty of natural feed for all immediate requirements, and during August, after the recent rains, feed should make fair growth. Pests—Mice are fairly bad; saffron thistles and stemless horse thistles are numerous, although saffron thistles are very small, but the numbers are there. Miscellaneous—Seeding is completed, and farmers are busily engaged in fallowing operations. Some shearing was done at the end of June and early July.

*Eyre Peninsula.*—Weather—Very dry, there only being 4 points on 16th of month and 26th points on 26th. Mild weather, free from frosts, but heavy mists and dews. Crops—Early crops looking splendid, but late-sown wheats badly need a good rain. All crops up; oats doing well, especially Scotch Grey, which is making splendid growth. Natural feed in abundance, and making wonderful growth during warm weather of this month. Stock—All in O.K. condition, and free from disease. Pests—Rabbits increasing, but not of any number to cause much damage yet. Miscellaneous—Olives and fruit trees all doing well.

*Kybybolite.*—Weather—Rain has fallen on 16 days, resulting in a total fall of 303 points, which is nearly  $\frac{1}{2}$ in. above the average for the month for the last decade. A total of 10in. has now fallen for the year, 7 $\frac{1}{2}$ in. of which being recorded since April 1st. These totals are 1in. below the average for the corresponding period of previous 12 years. The seeding and winter rains to date have been remarkably similar to those of the season 1912. A fair sprinkling of fine sunshiny days have been interspersed during rains, hence crops generally are looking healthy and well. Peas sown in June have germinated well. Early oat crops are rather rank. Natural feed is good for the time of year. Stock are in very good condition. Pests—Cockatoos have been severe on some late-sown crops.

*Turretfield.*—Weather—This month has been exceptionally dry, the only considerable rains fell in the last few days; altogether 139 points have been registered. On the 27th a severe windstorm did some damage to the growing timber. Crops are very backward, the early sown in many cases showing a heavy growth of rubbish; the later sown are cleaner, but the dry weather of the latter portion of June and the first three weeks of July was very much against late sowing. Natural feed—Although to some degree destroyed by the lucerne flea, it is now recovering. Stock—Lamb tailing has been fairly satisfactory, most keepers of sheep having fair percentages. Pests—The lucerne flea is still doing some damage, but not to the extent it was last month. Miscellaneous—Fallowing is being pushed on with.

# **POTASH!!!**

**MURIATE, 50%  
SULPHATE, 90%**



**Prompt Delivery.  
To Arrive.**

(Direct from the great mines of Alsace, controlled by the French Government.)

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We are now booking orders for the following goods—delivery as required during the season :—

**WOOLPACKS,**

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**SHEEP DIP.**

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**WE CAN ALSO QUOTE  
WIRE NETTING AND FENCING MATERIAL  
OF EVERY DESCRIPTION.**

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**DALGETY & COMPANY, LIMITED,  
ADELAIDE AND BRANCHES.**

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of July, 1921, also the average precipitation to the end of July, and the average annual rainfall.

Station.	For July, 1921.	To end of July, 1921.	Av'ge. to end July.	Av'ge. Annual Rainfall	Station.	For July, 1921.	To end of July, 1921.	Av'ge. to end July.	Av'ge. Annual Rainfall
<b>FAR NORTH AND UPPER NORTH.</b>					<b>LOWER NORTH—continued.</b>				
Oodnadatta .....	—	6.13	2.96	4.73	Spalding .....	1.96	14.44	10.61	20.18
Marree .....	—	4.09	3.63	6.02	Gulnare .....	2.28	13.01	10.16	18.97
Farina .....	—	5.32	4.09	6.57	Yaaka .....	1.82	12.59	8.54	15.27
Copley .....	0.05	7.56	5.13	8.30	Koolunga .....	1.78	13.29	8.89	15.73
Beltana .....	0.04	8.06	5.40	8.93	Snowtown .....	1.78	13.30	9.24	15.87
Blinman .....	0.12	8.73	7.69	12.52	Brinkworth .....	1.70	11.84	9.03	15.91
Tarcoola .....	0.10	12.39	4.04	7.33	Blyth .....	2.33	15.70	9.52	16.55
Hookina .....	0.42	15.33	7.46	12.65	Clare .....	2.74	17.81	14.08	24.47
Hawker .....	0.46	17.18	7.24	12.37	Mintaro .....	3.56	15.60	12.74	23.07
Wilson .....	0.56	17.00	7.08	11.85	Watervale .....	2.96	15.22	12.47	27.48
Gordon .....	0.46	20.69	6.03	10.43	Auburn .....	2.83	16.22	13.80	17.82
Quorn .....	0.65	19.70	7.84	13.79	Hoyleton .....	2.35	12.11	10.02	15.82
Port Augusta .....	0.31	16.41	5.50	9.42	Balaklava .....	1.28	11.10	9.05	13.14
Port Augusta West .....	0.28	15.79	5.20	9.36	Port Wakefield ..	1.27	13.19	8.00	13.54
Bruce .....	0.29	16.19	5.68	9.99	Terowie .....	1.43	13.53	7.29	13.97
Hammond .....	0.28	23.25	6.40	11.36	Yarowie .....	1.21	14.10	7.74	13.54
Wilmington .....	0.55	14.00	10.27	18.06	Hallett .....	1.90	13.10	8.78	16.28
Willowie .....	0.40	23.87	8.70	11.82	Mount Bryan .....	1.76	14.12	8.76	16.38
Melrose .....	1.52	15.46	13.62	23.11	Burra .....	2.40	14.92	10.21	17.91
Booderoo Centre .....	1.06	15.34	8.64	15.51	Farrell's Flat .....	2.52	14.85	10.54	18.87
Port Germein .....	0.70	18.22	7.17	12.65	<b>WEST OF MURRAY RANGE.</b>				
Wirrbarra .....	2.25	13.27	11.13	19.44	Manoera .....	1.92	13.19	9.99	18.54
Appila .....	1.04	18.60	7.71	14.90	Saddleworth .....	2.16	13.50	11.19	19.75
Cradoek .....	0.35	17.32	6.24	10.82	Marrabel .....	1.93	15.82	10.85	19.44
Carrieton .....	0.97	19.68	6.98	12.34	Riverton .....	1.56	11.57	12.74	20.74
Johnburg .....	0.62	15.34	5.68	10.22	Tarlee .....	1.60	10.38	9.91	17.86
Eurelia .....	0.98	18.57	7.37	13.11	Stockport .....	1.36	12.51	9.00	16.36
Orroroo .....	0.95	17.45	7.74	13.42	Hamley Bridge .....	1.27	11.71	9.33	16.52
Nackara .....	0.37	16.92	6.43	10.63	Kapunda .....	1.67	12.15	11.30	19.85
Black Rock .....	1.00	12.01	7.11	12.29	Freeling .....	1.10	9.90	10.03	17.95
Ucolta .....	0.37	12.12	6.60	11.65	Greenock .....	1.54	12.60	12.00	21.73
Peterborough .....	0.73	12.48	7.37	13.82	Truro .....	1.15	15.89	11.21	20.18
Yongala .....	1.16	13.25	7.77	14.13	Stockwell .....	1.15	13.38	11.34	20.40
<b>LOWER NORTH-EAST.</b>					Nuriotpa .....	1.55	13.99	11.80	21.09
Yunta .....	0.38	12.81	4.96	8.50	Angaston .....	1.81	14.52	12.66	22.33
Waukarina .....	0.06	10.46	4.72	8.14	Tanunda .....	1.83	13.01	12.75	22.54
Mannahill .....	0.31	14.67	4.82	8.51	Lyndoch .....	2.36	13.86	12.97	22.81
Cookburn .....	—	—	—	8.03	Williamstown .....	2.11	12.99	17.26	27.74
Broken Hill, N.S.W. .....	0.12	11.90	5.74	9.98	<b>ADELAIDE PLAINS.</b>				
<b>LOWER NORTH.</b>					Mallala .....	1.42	11.39	9.65	16.61
Port Pirie .....	1.16	16.02	7.70	13.26	Roseworthy .....	1.33	10.14	9.83	17.37
Port Broughton .....	0.83	13.55	8.32	14.13	Gawler .....	1.42	10.84	10.80	19.14
Bute .....	1.88	13.83	9.20	15.55	Two Wells .....	1.26	9.29	9.50	15.91
Laura .....	1.44	14.53	10.09	18.12	Virginia .....	1.43	9.88	10.21	17.11
Caltowie .....	1.32	14.91	9.20	17.02	Smithfield .....	1.29	9.02	9.90	17.33
Jamestown .....	1.98	13.96	9.56	17.56	Salisbury .....	1.38	9.46	11.08	18.52
Bundaleer W. Wks. .....	2.23	13.43	9.28	17.56	North Adelaide .....	2.53	15.11	12.94	21.87
Gladstone .....	1.46	13.47	8.76	16.05	Adelaide .....	2.01	12.86	12.67	21.01
Crystal Brook .....	1.43	17.52	8.79	15.62	Glenelg .....	1.79	10.25	11.10	18.42
Garrigeton .....	2.26	13.90	10.31	18.30	Brighton .....	2.18	13.40	12.50	21.03
Narriady .....	1.48	12.33	9.26	16.43	Mitcham .....	2.63	13.71	14.42	23.66
Redhill .....	1.75	16.76	9.59	16.66	Glen Osmond .....	2.50	14.05	16.59	25.73
					Magill .....	2.29	12.17	15.29	25.38



RAINFALL—continued.

Station.	For July, 1921.	To end July, 1921.	Av'ge. to end July.	Av'ge. Annual Rainfall
<b>MOUNT LOFTY RANGES.</b>				
Teatree Gully.....	2.80	13.44	16.50	27.73
Stirling West .....	4.87	23.07	27.90	46.82
Uraidla .....	3.85	20.48	26.56	44.49
Clarendon .....	4.17	19.57	19.85	33.18
Morphett Vale .....	2.97	13.85	13.58	22.90
Noarlunga .....	2.61	12.87	12.23	20.21
Willunga .....	4.09	16.40	13.70	25.82
Aldinga .....	3.24	15.55	12.28	20.22
Myponga.....	4.05	15.39	—	—
Normanville .....	2.81	18.74	12.67	20.53
Yankalilla.....	3.01	16.31	16.39	22.93
Mount Pleasant ..	2.94	17.57	15.71	27.01
Birdwood .....	3.07	16.50	16.03	29.43
Gumeracha .....	3.60	18.02	19.41	33.33
Millbrook Ravr. ..	3.89	17.12	—	—
Tweedvale .....	3.07	18.80	20.88	35.60
Woodside .....	4.30	18.25	18.55	32.05
Ambleside.....	4.38	19.62	19.76	34.81
Nairne .....	3.04	15.03	16.57	28.58
Mount Barker ....	3.99	18.13	17.10	31.10
Echunga .....	3.88	17.91	19.44	32.94
Macclesfield .....	3.40	15.22	17.52	30.60
Meadows .....	4.39	18.83	21.95	36.26
Strathalbyn .....	3.20	12.15	11.26	19.28

MURRAY FLATS AND VALLEY.

Meningie .....	2.10	9.48	11.04	18.77
Milang .....	1.53	8.13	9.24	15.56
Langhorne's Bdge.	1.27	10.44	8.25	14.59
Wellington .....	1.22	10.62	8.32	14.82
Tallem Bend .....	1.26	11.54	7.51	24.55
Murray Bridge .....	0.87	11.04	7.85	13.98
Callington .....	1.85	9.11	8.76	15.45
Mannum .....	1.03	10.98	6.75	11.51
Palmer .....	1.35	12.08	8.24	15.23
Sedan .....	0.55	12.27	6.88	12.07
Swan Reach .....	0.69	12.46	5.74	10.80
Blanchetown .....	0.37	8.94	5.76	10.26
Eudunda .....	0.71	12.83	9.69	17.51
Sutherlands .....	0.74	10.90	6.71	10.90
Morgan .....	0.32	11.06	4.82	9.13
Waikerie .....	0.23	9.57	4.97	9.41
Overland Corner ..	0.47	7.69	6.02	11.11
Loxton .....	0.48	7.95	6.49	12.27
Renmark .....	0.52	8.85	5.70	10.92

WEST OF SPENCER'S GULF.

Eula.....	0.11	5.01	6.45	10.03
White Well.....	0.24	—	5.27	9.24
Fowler's Bay .....	0.71	7.98	8.01	12.11
Penong .....	0.80	12.35	7.74	12.26
Murat Bay .....	0.47	7.29	5.87	10.47
Smoky Bay .....	0.96	8.12	6.03	10.37
Petina .....	1.06	9.34	7.66	12.97
Streaky Bay .....	0.77	9.62	9.78	15.09
Talia .....	1.62	10.68	8.79	15.35
Port Ellioton .....	2.35	9.09	10.53	16.37
Cummins .....	3.36	11.42	—	—

WEST OF SPENCER'S GULF—continued.

Port Lincoln .....	3.07	9.45	12.22	19.83
Tumby .....	2.69	12.29	8.25	14.76
Carrow .....	1.83	11.87	7.51	15.14
Arno Bay .....	0.98	13.43	7.15	13.10
Cleve .....	1.51	16.08	—	11.56
Cowell .....	0.59	8.49	6.68	11.84
Point Lowly .....	0.42	15.43	6.47	—

YORKE PENINSULA.

Walleroo .....	1.49	14.41	8.72	14.11
Kadina .....	1.63	15.62	9.74	15.93
Moonta .....	1.60	14.31	9.53	15.93
Green's Plains ....	1.57	13.34	9.29	15.75
Maitland .....	2.36	15.87	12.13	20.20
Ardrossan .....	1.95	13.64	8.28	13.96
Port Victoria .....	2.01	12.89	9.35	15.34
Curramulka .....	1.94	11.28	10.86	18.31
Minlaton .....	2.22	13.15	10.68	17.70
Brentwood .....	1.92	13.18	9.14	15.44
Stanabury .....	2.26	12.60	9.89	17.08
Warooka .....	3.32	14.18	10.79	17.74
Yorketown .....	2.71	12.54	10.34	17.29
Edithburgh .....	2.48	11.72	10.03	16.58

SOUTH AND SOUTH-EAST.

Cape Borda .....	3.97	15.39	16.24	24.96
Kingscote .....	3.43	12.36	11.88	18.92
Penneshaw .....	3.07	12.26	11.15	21.39
Victor Harbor .....	2.73	11.68	12.94	21.56
Port Elliot .....	2.85	12.33	11.98	20.00
Goolwa .....	1.92	12.89	10.78	17.87
Karoonda .....	1.49	13.15	—	—
Mindarie .....	1.05	7.33	—	—
Meribah .....	0.65	7.53	—	—
Pinnaroo .....	1.24	14.90	7.95	15.67
Parilla .....	1.33	10.32	8.28	14.02
Lameroo .....	1.54	10.84	7.55	16.45
Parrakie .....	1.51	10.10	7.17	14.42
Geranium .....	1.78	10.64	8.33	16.24
Peake .....	1.84	10.00	8.47	16.25
Cooke's Plains .....	1.93	11.43	8.28	15.00
Coomandook .....	1.97	13.12	9.69	17.75
Coonalpyn .....	1.63	8.43	8.87	17.64
Tintinara .....	2.64	9.88	10.25	18.83
Keith .....	2.36	10.29	9.91	18.54
Bordertown .....	3.34	10.36	10.82	19.52
Wolseley .....	3.15	10.68	9.90	18.07
Frances .....	2.72	9.53	10.66	20.10
Naracoorte .....	3.73	13.26	12.60	22.53
Penola .....	4.05	10.98	15.02	26.48
Lucindale .....	—	—	13.36	22.93
Kingston.....	—	—	12.26	24.51
Robe .....	—	—	15.37	24.60
Beachport.....	3.36	10.49	17.44	27.29
Millicent .....	4.43	13.47	18.09	29.29
Kalangadoo .....	5.31	15.09	—	—
Mount Gambier ..	3.76	11.65	18.28	31.65

## AGRICULTURAL BUREAU REPORTS.

## INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Aug.	Sept.			Aug.	Sept.
Alawoona .....	*	—	—	Elbow Hill .....	64	20	17
Aldinga .....	*	13	24	Eurelia .....	61	12	9
Amyton .....	*	—	—	Frances .....	†	27	24
Angaston .....	*	—	—	Freeling .....	*	—	—
Appila-Yarrowie .....	*	—	—	Gawler River .....	*	22	19
Arthurton .....	*	—	—	Georgetown .....	*	20	17
Ashbourne .....	86	—	—	Geranium .....	*	27	24
Balaklava .....	*	13	10	Gladstone .....	§	13	17
Balhannah .....	86	13	17	Glencoe .....	*	—	—
Barmera .....	76	19	16	Glossop .....	76	—	—
Beetaloo Valley .....	†	17	14	Gocde .....	*	17	14
Belalie North .....	*	13	17	Green Patch .....	†	—	—
Berri .....	76	17	14	Gumeracha .....	77	22	19
Big Swamp .....	†	—	—	Halidon .....	*	—	—
Blackheath .....	†	13	17	Hartley .....	79	17, 26	14
Black Springs .....	§	—	—	Hawker .....	†	16	20
Blackwood .....	*	15	19	Hilltown .....	*	—	—
Blyth .....	61	20	17	Hookina .....	50	18	15
Booleroo Centre .....	†	—	16	Inman Valley .....	*	—	—
Borrika .....	*	—	—	Ironbank .....	79	20	17
Bowhill .....	*	—	—	Julia .....	*	—	—
Brentwood .....	†	18	16	Kadina .....	*	—	—
Brinkley .....	76	13	17	Kalangadoo .....	*	13	10
Bundaleer Springs ..	*	—	—	Kanmantoo .....	*	13	17
Burra .....	*	—	—	Keith .....	86	—	—
Bute .....	*	16	13	Ki Ki .....	76	—	—
Butler .....	63	—	—	Kilkerran .....	61	18	15
Cadell .....	76	—	—	Kimba .....	*	—	—
Caltowie .....	*	—	—	Kingscote .....	*	—	—
Canowie Belt .....	*	—	—	Kingston-on-Murray.	*	—	—
Carrow .....	*	18	15	Kongorong .....	§	18	15
Cherry Gardens .....	77, 86	16	13	Koonibba .....	*	18	15
Clanfield .....	*	—	—	Koppio .....	67	15	12
Clare .....	§	18	16	Kybybolite .....	*	18	15
Clarendon .....	*	15	12	Lake Wangary .....	67	13	17
Claypan Bore .....	68	17	14	Lameroo .....	76	—	—
Cleve .....	†	17	14	Laura .....	57	19	16
Collie .....	†	—	—	Leighton .....	*	—	—
Colton .....	*	—	—	Lenswood and Forest	*	27	24
Coomandook .....	*	26	30	Range .....	†	17	14
Coonalbyn .....	76	17	14	Lone Gum .....	†	—	—
Coonawarra .....	*	—	—	Lone Pine .....	§	—	—
Coorabie .....	*	—	—	Longwood .....	80	—	—
Craddock .....	†	—	—	Loxton .....	*	—	—
Crystal Brook .....	62	13	17	Lucindale .....	*	—	—
Cummins .....	*	20	17	Lyndoch .....	61	18	15
Cygnat River .....	77	18	15	MacGillivray .....	*	17	14
Dawson .....	*	—	—	McLachlan .....	†	6	3
Denial Bay .....	*	—	—	Maitland .....	§	6	3
Dowlingville .....	*	—	—	Mallala .....	†	—	5
Edillilie .....	*	27	24	Mangalo .....	*	—	—

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Branch	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Aug.	Sept.			Aug.	Sept.
Meadows .....	80	17	14	Ramco .....	69	15	12
Meningie .....	81	—	—	Redhill .....	57	23	20
Meribah .....	*	17	14	Renmark .....	69	12	—
Milang .....	*	13	10	Riverton .....	*	—	—
Millicent .....	†	6	3	Riverton (Women's) ..	*	—	—
Miltalie .....	67	13	17	Roberts and Verran ..	65	16	12
Mindarie .....	*	1	5	Rockwood .....	83	15	19
Minlaton .....	*	19	16	Rosedale .....	61	17	14
Minnipa .....	67-8	—	—	Rosy Pine .....	76	—	—
Minaro .....	54	13	17	Saddleworth .....	†	—	—
Mona to South .....	68	—	—	Saddleworth	†	—	—
Moonta .....	62	19	16	(Women's)	—	—	—
Moorak .....	†	18	15	Salisbury .....	58	2	6
Moorlands .....	*	—	—	Salt Creek .....	†	—	—
Moorook .....	*	—	—	Sandalwood .....	†	—	—
Morchard .....	†	13	17	Shoal Bay .....	*	—	—
Morgan .....	*	—	—	Smoky Bay .....	67	13	17
Morphett Vale .....	86	18	15	Spalding .....	*	—	—
Mount Barker .....	*	17	14	Stockport .....	†	—	—
Mount Bryan .....	*	—	—	Strathalbyn .....	86	16	13
Mount Byran East ..	54	—	—	Talia .....	†	8	12
Mount Compass .....	*	—	—	Tantanoola .....	*	—	—
Mount Gambier .....	†	13	10	Taplan .....	72	20	17
Mount Hope .....	64-5	13	17	Tarcowie .....	†	16	13
Mount Pleasant .....	81	—	—	Tatiara .....	†	20	17
Mount Remarkable ..	*	—	—	Two Wells .....	†	—	—
Mundalla .....	†	17	14	Uraidla & Summertown	83	1	5
Mundoora .....	*	22	19	Veitch .....	*	—	—
Murray Bridge .....	76	16	—	Virginia .....	59	—	—
Mypolonga .....	†	17	14	Waikerie .....	*	—	—
Myponga .....	*	—	—	Wall .....	*	—	—
Nantawarra .....	†	18	15	Wanbi .....	*	—	—
Naracoorte .....	*	—	—	Warcowie .....	*	—	—
Narridy .....	58	20	17	Watervale .....	*	—	—
Narrung .....	*	20	17	Whyte-Yarcowie .....	†	—	—
Neeta .....	*	—	—	Wilkawatt .....	73	13	17
Netherton .....	†	12	19	Williamstown	61	13	7
North Booborowie ..	55	—	—	(Women's)	—	—	—
North Bundaleer .....	58	—	—	Williamstown .....	60	12	—
Northfield .....	*	10	14	Willowie .....	*	17	14
Nunkeri and Yurgo ..	*	7	11	Wilmington .....	50	17	14
O'Loughlin .....	*	17	14	Wirrabara .....	57-8	13	10
Orroroo .....	61	—	—	Wirrega .....	*	—	—
Parilla .....	*	—	—	Wolowa .....	*	—	—
Parilla Well .....	68	15	12	Wudinna .....	*	—	—
Parrakie .....	*	—	—	Wynarka .....	74	20	17
Paruna .....	*	—	—	Yabmana .....	†	—	—
Paskeville .....	*	16	13	Yacka .....	†	16	13
Penola .....	†	6	5	Yadnarie .....	68	16	13
Petina .....	*	27	24	Yallunda .....	†	—	—
Pine Forest .....	*	16	13	Yaninee .....	*	—	—
Pinnaroo .....	76	19	9	Yeelanna .....	68	13	17
Pompoota .....	*	—	—	Yongala Vale .....	*	19	16
Port Broughton .....	*	19	16	Yorke town .....	*	—	—
Port Elliot .....	86	20	17	Younghusband .....	74	18	15
Port Germein .....	†	13	17				

\* No report received during the month of July.

† Held over until next month.

† Formal report only received.

‡ Annual meeting.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS. UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

HOOKINA (Average annual rainfall, 12in.).

June 16th.—Present: eight members.

CARE OF FARM MACHINERY.—Mr. M. Henschke, who read a short paper dealing with this subject, said if farmers wished their implements to have a long and useful life they should take better care of them. When the harvester had finished its work for the season it should be thoroughly overhauled, and a note taken of any parts that might be required for the next year's work. The machine should then be placed under cover. The same should also apply to the drill and the binder. It was a good plan to give all the woodwork a coat of oil and paint, and if a little kerosine was placed in the oil holes it would prevent them from rusting. A dressing of neatsfoot oil applied to the belts would considerably lengthen their life. In the discussion that followed, Mr. S. Stone favored a gable-roofed iron and stone shed for machinery. He considered if the shed was built fairly high it would be almost as cool as a straw shed. Mr. B. Murphy also favored the iron shed, but if the straw shed was used where poultry was let run at large, it was as well to build it a little distance from the yards, as it was hard to keep it waterproof if poultry were allowed to climb on it.

HOOKINA (Average annual rainfall, 12in.).

July 14th.—Present: nine members and five visitors.

BLACKSMITH SHOP ON THE FARM.—In the course of a short paper dealing with this subject, Mr. P. B. Henschke said a smithy was a necessary item in the outfitting of every farm, and the cost of purchasing a suitable kit of tools should not amount to a very great sum of money. All the implements, before being worked in the field, should be taken to the blacksmith shop, and thoroughly overhauled. The amateur blacksmith should start on simple work, and by patience and perseverance work himself up in the trade, until he could accomplish all the necessary repairs. From an economic point of view it was advisable to have a blacksmith shop on the farm, because for work that would perhaps take only a short time to do at home, at least a day would be lost in taking the machine to the township. Again, a small defect in some implement which might not be considered as serious enough over which to lose a day's work in the busy season, might result in a much shorter life of the implement, and during wet weather, when outside work could not be done, the time could be valuably spent in the blacksmith shop, making split links, etc. After an interesting discussion had taken place, the annual report was presented by the Hon. Secretary (Mr. B. Murphy), and the officers were appointed for the coming 12 months.

WILMINGTON (Average annual rainfall, 18.26in.).

June 22nd.—Present: 12 members.

FENCING.—Mr. A. J. Scott, who read a short paper dealing with this subject, said a very serviceable fence could be erected by using good split red gum posts placed 12yds. apart, with two 2in. x 1in. jarrah droppers between each panel, and

good strainers about 130yds. apart. The droppers could be purchased, bored with six holes, at a cost of about 4½d. each. The droppers should be about 2in. outside of the end of the holes. The easiest way to put them on was to place the two droppers on the ground alongside the post, and draw in the bottom wire first, and then strain it. Then erect the barb wire on top, and secure the dropper to it, when the other wires could be pulled in without very much trouble. When renewing fences he made a practice of sinking fresh holes, for he was convinced that posts lasted for a longer period in new holes than they would if placed in the old holes. The following details of costs of erection were quoted by the speaker:—"Erection of fence with posts 12yds. apart and two jarrah droppers between.—Purchase of 146 posts, at 1s. 6d. per post, £10 19s.; erection of posts, at 1s. each, £7 6s.; purchase of 292 droppers, at 4½d. each, £5 9s. 6d.; erection of 292 droppers, at 1d. each, £1 4s. 4d.; additional cost of 14 strainers, at 3s. each, £2 2s. Total, £27 0s. 10d. Erection of fence with posts 5yds. apart.—Purchase of 352 posts, at 1s. 6d. per post, £26 8s.; erection of posts, at 1s. each, £17 12s.; additional cost of 14 strainers, at 3s. each, £2 2s. Total, £46 2s. From these figures it will be seen that the difference in the two classes of fence will amount to £19 1s. 2d. per mile." In the discussion that followed, Mr. Stephens agreed with the use of droppers by placing them in panels 10yds. between ordinary posts. Droppers should not be allowed to touch the ground. It was best to keep the wires tightly strained when droppers were used. Such a fence was easily erected after a flood or fire. Messrs. George and Zimmermann maintained that the wires should be put through the droppers. They did not favor the use of tie wires.

EURELIA, July 15th.—The meeting of the Branch was devoted to a discussion on the subject, "Noxious Weeds." Members expressed the opinion that all district councils should take active steps to prevent the spread of noxious weeds. It was decided to hold the September meeting on the 9th of the month.

ORROROO, June 18th.—A lengthy discussion took place *re* the destruction of noxious weeds. Mr. Cottrell tabled two samples of green wheat, standing 2ft. and 1ft. high respectively. He asked members whether it would be advisable to feed off the crop. Members thought the best plan would be to let it grow and ensure a good hay crop.

## MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BLYTH (Average annual rainfall, 16.46in.).

May 21st.—Present: 17 members.

Mr. A. L. McEwin gave an address, "Wheat Matters," in which he referred to marketing of wheat and the compulsory pooling system, which he denounced in favor of the old system of a free market.

THE PASSING OF THE HORSE.—At a further meeting, held on June 25th, Mr. R. Buzacott contributed a paper on this subject. He said 30 years or 40 years ago the horse was considered an indispensable adjunct to farming, but with the advent of various types of engines the horse was gradually being displaced. The motor car and bicycle had proved so useful to the farmer that one rarely saw a man on horseback. Many of the businesses in the city that were previously devoted to buggy and carriage building had converted their shops into factories for the manufacture of motor cars, lorries, and trucks. The horse was being displaced because the farmer was able to obtain a better, quicker, and cheaper means of transport. In days gone by the horse was invariably used as the motive power for cutting chaff, but if one noticed a horse works on the farm it was immediately thought that that farmer was behind the times. The oil and petrol engines for this work had almost entirely taken the place of the horses. He believed the tractor would be a great factor in removing the horses from farming operations. The speaker was convinced that the higher wages demanded by labor and the shorter hours of work were also factors that would assist in displacing the horse from agricultural pursuits. With the tractors in use the farmers would be able to harvest much more of the crops in the form of grain than they did at the present time. All that one would need to eat would be a small quantity for the cows. The motor vehicle

was playing a great part in assisting the community in travelling from one part of the State to another, in raising land values, and in building up the revenue of the country. Most members present criticised the paper, and it was strongly held that the horse had not and would not pass out of farm work to the extent it had in lighter traction, such as motor cars, trucks, bicycles, &c. Mr. Buzacott's paper caused a good discussion, and a most enjoyable evening was spent.

**CRYSTAL BROOK** (Average annual rainfall, 15.62in.).

July 16th.—Present: 15 members and two visitors.

**FRUIT GROWING.**—The following paper was read by Mr. Sarre:—Fresh fruit as an article of diet is a necessity in our hot climate, and that this is recognised in our own favored district is evidenced by the fact that practically 90 per cent. of the local householders grow fruit of some variety for home use, and occasionally have some for sale. The fruit of the citrus tribe predominates, the general quality of which is second to none in the State. The soils of lower-lying portions of our town in many instances for years have had flood waters running over them, with the result that the fertile surface has been washed away, leaving the clay subsoil very near the surface. It is not a good policy to plant such portions too heavily with citrus trees, for they do better in the higher, freer soil, which, as a rule in our district, has a more porous subsoil, and naturally is better drained, for although citrus trees require plenty of moisture, yet to succeed they must have good drainage. In planning the garden, arrange for the ground to be broken up some weeks before planting time. Find out how many trees the block will carry (at least 14ft. apart), and then go ahead with the ordering. If some months before planting time, so much the better, for you are then more likely to get the varieties that you require, and the trees will probably be of a better type than if left until the last minute. In advising you to find out how many trees your block will carry, I do not wish you to overlook the fact that you will probably be growing vegetables, and if you have not a separate plot for a kitchen garden, then leave an open space amongst the trees, otherwise you will

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find in time that there is not room for both fruit and vegetables to grow to perfection. If possible, throw out the soil from the tree positions some weeks ahead of planting time, to allow the sun and air to sweeten it. It is not necessary to make a hole larger than, say, 30in. wide and 18in. deep, providing the whole of the soil has previously been deeply broken. After making the hole, loosen the bottom soil and mix a little bonedust with it. Do not make the mistake of mixing stable manure in with the soil when planting, as many failures are traceable to this error. Have everything ready for rapid planting before the trees are delivered; overhaul them, cut back bruised or broken roots, and shorten the over long ones to about 18in. in length. If planting single-handedly, I advise driving a stake into the centre of the hole, and tying the tree about the same depth as it was in the nursery. This will allow the use of both hands to spread the roots and fill in the earth. Pack the earth around the roots, and when the hole is about three parts full, give a good watering. When the water has soaked away fill the rest of the earth into the hole; then if you experience a dry spell the moisture will not evaporate so rapidly, nor will the soil bake so hard as if the water was put on the surface. Plant the deciduous trees in winter, say, from May to August; the citrus in April and May, and again in August and September. Shelter the citrus trees from wind and frost as much as possible when young, and if the young trunks are not shaded by foliage, it is advisable to tie some straw loosely around them during the heat of the summer, for the bark being thin, they easily burn, and their development suffers. On the other hand, all trees require plenty of sunlight for healthy development of fruit and foliage, and if the deciduous trees are planted closely to the house, on the shady side, they are drawn up tall and spindly, and are unsatisfactory in every way. If you wish to utilise the shade, grow potatoes. If the citrus trees arrive with a ball of earth attached, all things being favorable, it is as well to plant it in that condition; but do not plant them deeply. Water them in as stated previously. Cut back sappy or spindly growth. If the trees are not doing well the cause may possibly be that they are planted too deeply. If you value the tree, try pulling it up and replanting at a more shallow depth. All deciduous trees require cutting back hard the first winter to shape them, and regularly each following winter for producing good fruit and vigorous growth. If this operation is neglected or unskillfully performed the tree suffers more or less in consequence, and the fruit is inferior. Deciduous trees that are exceptionally vigorous in growth and produce but little fruit, can be brought into a more fruitful habit by judicious summer pruning and light winter pruning. The reverse is the case with weakly trees, for they should be pruned hard back in the winter and left untouched in the summer. Citrus trees are pruned in the spring, just before coming into bloom. If the tree has been shaped, the pruning consists of thinning out the fruiting terminals of the limbs, for as a rule good fruit does not grow inside of the limbs, and also clearing out the inside of the tree, being careful not to expose the inside bark to the direct rays of the sun. *Varieties of Fruit Trees Proving their Merits in this District.*—Apples and pears are not an unqualified success, but in some instances a few varieties prove profitable, although all of them have a tendency to fall, if, after a hot northerly wind, we receive a sudden chill from the south. The Cleopatra is the most reliable apple. Apricots grow vigorously and crop well, but the fruit requires thinning to secure quality coupled with size. In the bulk of our small local gardens I find that the trees are small and sickly, due to having been allowed to crop too heavily when young, and left almost unpruned. Good varieties are Oullin's Early, Tilton, Moorpark, and Riverside Late. Almonds.—Although not suitable for small gardens, they will prove profitable when pruned and cultivated. Good sorts are Ne-Plus-Ultra, California papershell, and Commercial Peerless. Figs do well, but require a good deal of space. Castle Kennedy, Black Ischia, White Adriatic, and Turkey are good varieties. Loquats.—Apart from being a good shade tree, the following varieties bear splendid fruit:—Enormity, Chatsworth Victory, and Herd's Mammoth. Nectarines.—Goldmine is probably the best in our district. Early Rivers bears very large fruit. Oranges.—St. Michael, Mediterranean Sweet, Navels, Thompson's Imp, Washington, and Nugget. Mandarins.—Dancy, Canton, and Emperor. Lemons.—Lisbon and Chatsworth. Pears.—The medium early varieties, such as Brockworth Park, Clapp's Favorite, Howell, Williams' Bon Chretien, and Bartlett or Duchess are most likely to succeed in our district. Peaches do exceptionally well, and many fine-fruited seedlings have come under my notice of recent years, but if one intends

planting it is advisable to get grafted trees, rather than risk planting seedlings. The early varieties of peaches have a constitutional weakness, in that they are prone to shed their buds, and their fruit yield is oftentimes very disappointing. Heavy-yielding varieties that will provide fruit from December to March are Triumphs, Wiggin's, Lours Grognet, Mountain Rose, Elberta, Sea Eagle, and Salway. Plums.—European plums are not a success here, although some of the prunes bear well. Japanese plums bear heavily, and some varieties are delicious, but the trees are reputed to have but a short life. This, of course, may be due to faulty pruning. Some varieties that I have proved are Ballena, Burbank, Rubio, Satsuma, and Wickson. Grape vines do exceptionally well here, but in a great many gardens they have been allowed to straggle just in whatsoever direction the canes grew, with the result that but few grapes develop, and those are very inferior. The vines also are an eyesore, whereas if trained on a 4ft. wire fence or trellis, they could be kept tidy, and produce good fruit. Vines do best and are easier to prune and keep tidy if trained on the cordon or espalier systems. They also yield well on high trellises for shading the house, &c., if trained on the above lines, but probably the best fruit comes from the bush-trained vines. If you wish to cover a high trellis, choose the strong-growing ones, such as Crystal, Zante Currant, Grand Turk, Lady Finger, &c. For bush or low trellis, Muscat, Gordo Blanco, Black Hamburg, Black Prince, Red and Black Malaga, Waltham Cross, Sultana, &c. Vines do well planted from 7ft. to 9ft. apart. Stable manure is a good all-round manure, but failing a sufficiency of that, use superphosphate, sulphate of ammonia, sulphate of potash, and bonedust. Mulch all trees if possible with straw, grass, or long manure during the hot weather, but the mulch that is much neglected is the dust blanket. If one keeps the soil stirred up continually it conserves a wonderful amount of moisture, and your trees appreciate it.

#### MINTARO.

June 11th.—Present: 10 members.

**PIG KEEPING.**—A short paper on this subject was contributed by Mr. R. Hall, and read by Mr. D. Kelly. The writer of the paper said that the site chosen for the sties should be on a sloping piece of land, and the fences of the enclosure erected with cyclone wire. Referring to the breeds, he favored sows from a Poland-China-Berkshire cross mated with a Berkshire boar. The young boars should be castrated at eight weeks old, and then placed in a sty by themselves. The feeding of the animals was a very important point. It was better to give the animals small feeds at regular intervals, rather than put large quantities of food in their troughs, and allow it to become stale. For the first few days he made a practice of feeding the young pigs on a mixture of pollard and milk, and as they became older, crushed wheat, peas, or barley could be added to the food. Such a ration could be continued until they weighed about 80lbs., when they could be sent off to the market. If a small quantity of oil was poured along the animals' backs just before sending them to the sale it would give them a nice healthy appearance. In the discussion that followed, Mr. Kelly thought it was better to confine the pigs in a paddock, rather than in a sty. Mr. Blatchford said the pig industry had proved a payable investment during the past year. He preferred the progeny of a crossbred sow and purebred boar. Excellent floors for the sties could be made from the slate from the local quarries. Mr. Garrett, sen., told of the very good returns he had obtained by feeding shrivelled wheat to pigs. On another occasion a portion of one of his paddocks had been badly affected with rust, so he fenced it off, and allowed the pigs to graze off the crop. The animals had done exceptionally well, and returned a good profit. When the sows were about to farrow he enclosed them in a sty that had a rail placed 6in. high and 6in. from the wall to prevent the mother from lying on her young. Mr. H. Schunke advised the erection of a raised platform, about 6in. or 8in. high, in every sty, to ensure the pigs a dry and warm sleeping place. A short discussion also took place on "Bacon Curing."

**MOUNT BRYAN EAST** (Average annual rainfall, 16in.).

June 18th.—Present: six members.

**CARE AND BREEDING OF MERINO SHEEP.**—Mr. C. Dare read the following paper:—For this district I consider, and I think it is the general opinion, that the medium quality woolled sheep is the most suited, and it is to this type of sheep rather than



the strong or very fine woolled sheep that I will refer in this paper. The ram is the main factor in breeding to a type, and a ram of this class should be a fair-sized animal, with a medium-sized head and horns set back, but not too close to the head, nostrils wide, with a few wrinkles on the nose. He should also have a short neck, deep shoulders, well-sprung ribs, and full quarters set on stout legs wide apart. The wool should be fairly dense and long, of medium quality, and showing a fair amount of crimp or character. It is quite common to breed with both two-tooth ewes and rams. I am not in favor of this practice, and consider that both ewes and rams should not be mated until four-tooth, and a larger, better framed flock will result. Very old rams, of course, should not be used, and to have a sure lambing I would use from 3 per cent. to 4 per cent. of rams, and it is a good practice to introduce a few fresh rams before finally separating the ewes. Neither ewes nor rams should be very fat when mated. It is a matter of opinion as to the best time of the year for lambing, but in this district I think the early lamb is to be preferred. I see no harm in an occasional summer lambing, and if method and discretion is used the summer lamb usually turns out to be a very hardy sheep. As the blowfly has now become such a serious pest, all the ewes should be crutched before lambing, and also the hoggets should be treated in like manner. A good many people, and also large stations, do their culling at two-tooth, but I think the main culling of the ewes should be left until four-tooth, as a decided improvement often takes place from one to two years old.

#### NORTH BOOBOROWIE (Average annual rainfall, 16.35in.) July 19th.

**THE SOIL.**—The manager of the Booborowie Experimental Farm (Mr. E. A. Bristow), read the following paper:—Soil is considered the basis and source of all crops. To know soil and how to handle it is to be on the right road to agricultural success. Nothing connected with farming is receiving more attention at the present time than the soil, and not until the rudiments of of any science are mastered can a thorough acquaintance with its details be achieved, and this applies equally well to modern farming. The better acquainted a farmer is with soil, its nature, composition, characteristics, &c., the better will he be able to cope with the problems of growing crops and livestock and to conduct practical farming as a business. For all practical purposes of farming, soil is that part of the earth's surface which a farmer tills in order to grow crops. Ninety to 95 per cent. of all soil consists of ground rock or mineral matter known as sand, silt, and clay. Soil may be divided into soil and subsoil, but the division is a very general one. **Subsoil.**—That layer of soil just beneath the plough-cut is the subsoil, or, from a farmer's point of view, the soil is the part that is cultivated, and the subsoil is that part beneath it which is undisturbed. All the soil below the depth to which it is worked must, in the very nature of the case, partake of the character of subsoil. **Subsoil.**—Owing to the fact that the subsoil beneath plough-depth is seldom, if ever disturbed, it is always more solid than the soil. Also, naturally, the subsoil is made still more solid by the weight of the implements and teams travelling over it, to say nothing of the constant weight of soil resting on it for thousands of years. The physical way of telling soil from subsoil is by noting the difference in color, while the mechanical way is, as has been described, by the plough. The difference in color is very perceptible when sinking holes into the earth, or it may be noticed in cuttings. Both soil and subsoil have exactly the same origin, but their compositions differ. The soil is darker in color, because it contains more animal and vegetable matter. **Top Soil.**—While the two divisions of soil are easily recognised and universally accepted, farmers and experimenters subdivide the soil into "top soil," "soil," and "subsoil" whenever they wish to designate the subdivisions accurately or to express a preference for any particular portion of soil, so that they may not be misunderstood as to the quality. The surface layer, therefore, is invariably called the "top soil," so well do we know by actual experience the superior value of the first few inches. **Weathering.**—The hard material of the soil is found to be merely powdered rock. The finest clay can be recognised as having belonged, at one time, to some particular rock. The present condition of the mineral material of soil shows that it has precisely the same kind of structure as the rocks that are

found in the earth; the only difference being that the mineral particles of soil are so finely divided that they are invisible to the naked eye. Geology explains the methods by which the mineral matter of soil has been reduced to such fineness. It tells us that at one time in the history of our globe the earth was a molten mass, and that on cooling, the surface became solid rock. Then this hard surface was acted upon by heat and cold, as well as by rain and snow, also by the freezing and thawing of water, and, by the action of the various agents mentioned, the surface rock was ground into fine clay, silt, and sand—the mineral constituents of all soils. The action of these various natural forces in breaking down the rock is called “weathering.” Ice is considered to be the most powerful and rapid agent in weathering. Ice in the form of a glacier plays a very important part in weathering. Soil Composition.—The soil is composed of mineral, animal, and vegetable matter. The mineral matter consists of the very finest particles, or grains, of the earth's surface. With the exception of size, there is no difference between these particles of soil. Soil has been divided into seven different sizes, viz.:—(1) Coarse sand or fine gravel, (2) medium, (3) fine, (4) very fine sand, (5) silt, (6) fine silt, and (7) clay. This division of soil grains into their different sizes is called the “mechanical method of distinction between soil particles, because it is done by means of machines or sieves. Size of Soil Grains.—The following may help to give a better idea of how exceedingly fine the powdered rock must be in order to make good soil. Roughly, it requires from 25 to 50 particles of coarse sand, laid out in a row, to make a linear inch, and 50 to 100 grains of the medium sized are required to make lin. Of fine sand, from 100 to 250 grains, while of very fine sand from 250 to 500 grains are required. From 500 to 2,000 grains of silt would be necessary to make 1 lin. in., while lin. of fine silt requires from 2,000 to 5,000 grains. Clay, which is composed of the finest of all the ground rock materials in soils, includes all the particles that require from 5,000 to 250,000 placed end to end to make lin. in length. What one sees when ploughing is merely a mass of these soil particles. Stones and Rocks.—One-twenty-fifth of an inch in length or diameter is fixed as the limit for the largest-sized grain allowable for soil purposes; all the other mineral matter larger than this must be regarded as stones or rocks, and are not at all adapted for farming. Kinds of Soil.—There are two kinds of soil—one known as virgin soil, and the other as cultivated, or farmed, soil. A virgin soil is one that has never been farmed, and a cultivated soil we know well. The mineral matter of both these soils is identical, but the animal and vegetable matter in virgin soil is present there entirely through natural conditions, while cultivated or farmed soil has the great bulk of its vegetable and animal material artificially supplied. Virgin Soil.—The animal matter of virgin soil consists of the dead bodies of animals. This matter includes the bones and flesh of the large animals of past ages, now almost extinct, and also those of the smaller ones, birds, insects, and all the animals we are familiar with at this period. The vegetable matter of primary soil includes decayed roots, plants, stubble, stalks, trees, and leaves, as well as the excreta and urine of the wild animals that roamed the earth before our existence. All soil of new countries is of this character. Such was the soil of Australia when it was discovered, roughly, 133 years ago, but there is comparatively little of such land now (*i.e.*, land suitable for cultivation), and every year it is getting less. Cultivated Soil.—The vegetable matter supplied to the soil in the way of manure is chiefly done in our country through the medium of livestock, while in older countries it is done by means of stable manure. This can also be done by the ploughing under of green crops. This supply of organic matter to the soil must be maintained. Humus.—The dark-brown residue that remains after the decay of organic matter is called “humus.” Field crops cannot be grown successfully without it; in fact, there is no other substance known that can take its place. As well as furnishing an immense amount of fertility, it serves as a reservoir of film water for the use of growing plants. No vegetable or animal matter of any kind is humus in the course of decay; it must decay before it is humus. Decaying organic matter liberates heat. Therefore, when humus is being formed, more heat is added to the soil. The presence of humus makes a soil lighter, bulk for bulk, than if it were absent. This is due to the fact that humus weighs less than the soil particles that it replaces. Owing to its bulkiness, humus forces the soil particles farther apart; thus the soil is less compact and easier to work. This darker shading near the surface than is the case farther down is due to the more plentiful supply of humus near the surface. Humus

diminishes as the depth into the earth increases. Bacteria, that live in the soil, and are very active in the decomposition of manure and in the furnishing of food for higher plant life, are also very plentiful in the topmost soil. Recent investigations have proved that bacteria is in the soil to a greater depth in good soil than was formerly supposed, due to the fact that the bacteria will go wherever there is plant food. They are effective agents in bringing about the rapid decay of organic matter, especially in the spring, summer, and early autumn. That is in cooler climates, but not under Australian conditions. Their work, however, does not progress in the winter. Humus is an exceedingly spongy substance that will absorb a great amount of water. The following experiment well illustrates the power of humus to hold water. If 100lbs. of sand is placed in a vessel with a perforated bottom, and water poured on until it commences to run out of the bottom, the sand will have absorbed, roughly, 25lbs. of water. On the other hand, if 100lbs. of humus is placed in a vessel with perforated bottom it will absorb 200lbs. of water before the water commences to run out of the bottom. A peculiar property of humus is that it not only holds water like clay, but it readily gives up this water to growing plants. Humus also keeps the soil particles open in clay, while it makes the sand particles more inclined to hold together, and thus gives the sand better water-holding qualities. From what I have stated it is easy to see that all organic matter in the soil eventually becomes humus. The presence of humus in soil exerts a wide range of influence in soil activity. It not only furnishes color, plant food, water, and friability to soil, but its action renders phosphoric acid and potash available in soil to a great degree. It prevents rain from washing ammonia out of the soil, because it fixes or holds the ammonia until the plant is ready to use it."

#### REDHILL (Average annual rainfall, 16.79in.).

June 21st.—Present: eight members.

NOTES ON SEEDING.—Mr. H. T. Torr contributed a paper on this subject. First, he said, it was essential to have a good seed bed, which could be obtained by either summer or spring fallowing. Different lands required different depths of fallowing, according to the nature of the soil. Most of the land in that district would produce good results if fallowed from 4in. to 5in. deep. The fallow should be harrowed, scarified, and harrowed before harvest. In dry seasons it would be very beneficial to subpack the soil before the summer set in, and thus retain the moisture. He also recommended harrowing after every good rain. The best seed obtainable should be procured, either from farmers who specialised in seed wheats, or from one of the Government experimental farms. If selecting one's own wheat, it should be cleaned either by an ordinary winnower or by a grader. It should then be pickled with bluestone, either on a cloth or floor, turning with a shovel, or in bags placed in a cask or some other receptacle. He gave preference to methods that would break the air bubbles. There were several different methods of sowing; he preferred starting when the weeds had commenced to grow and the ground was wet, but not boggy. He would cultivate in front of the drill and harrow behind. The quantity of seed required per acre depended on the season. During the present year from 75lbs. to 90lbs. of wheat could safely be used, but in dry seasons lesser quantities gave better results. Rolling was necessary, especially in dry seasons. A good discussion followed the reading of the paper.

#### WIRABARA (Average annual rainfall, 18.91in.).

July 16th.—Present: 20 members.

The subject, "Destruction of Noxious Weeds," was brought before the members for discussion. The Hon. Secretary (Mr. E. J. Stevens) presented the annual report, and the officers were appointed for the ensuing 12 months. The following dates of meetings for the year ending December, 1921, were arranged:—August 13th, September 10th, October 8th, November 5th, December 17th.

LAURA.—The Hon. Secretary (Mr. E. Hollitt) has submitted the following programme of meetings:—August 19th.—Roseworthy Agricultural College Short Course delegates' report. September 16th.—Paper: "Value of Sudan Grass," Mr. F. T. Hughes. October 14th.—Homestead meeting. November and December.—Recess. 1922. January.—Paper by Mr. Blessing. February.—Paper: "Fruit

Drying," Mr. W. Pledge. March.—Paper, "Seeding Operations," Mr. H. B. Lines. April.—Paper: "Fruit Growing." May.—Paper: "Poultry," Mr. H. Hammill. June.—Annual meeting. Meetings are held Fridays nearest full moon.

NARRIDY, July 16th.—Several interesting matters of local importance were brought before the meeting. Members also discussed items referring to the forthcoming Annual Bureau Congress.

NORTH BUNDALEER, June 16th.—The Wool Instructor of the School of Mines (Mr. Codrington) attended the meeting, and gave a wool-classing demonstration.

WIRABARA, June 18th.—Matters in connection with the Annual Congress were brought forward, and other topics of local interest were discussed.

## LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

SALISBURY (Average annual rainfall, 18.57in.).

July 5th.—Present: 23 members and visitors.

FARM MANAGEMENT.—A paper on this subject was contributed by Mr. H. Bussenchutt. The first item mentioned by the speaker was the management of farm stock. The settler should endeavor to obtain a good class of useful farm horses, and keep them in good condition. He always made a point of giving the horses a drink before the mid-day meal, not afterwards, as was sometimes done. The handling of the colt should begin when he was a foal, at weaning time for preference. He should be trained to tie up and lead, and if his feet were trimmed occasionally there would not be very much trouble when the time came for him to be broken in. Great care should be taken with the shoulders, especially for the first few days. Only light work should be given, and the shoulders and collar should be

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kept thoroughly clean. A good stable should be erected, with a separate stall for each animal, and if the harness of each horse was kept on a separate peg there would be no fear of the collars, &c., becoming mixed. Unless one had sufficient help he did not think it advisable to keep more than two or three good cows. Referring to the keeping of sheep, the speaker said he had always found the Merino the best type of sheep for the farmer. A few crossbreds were useful, in that they grazed over a larger area of paddocks, and were a great help when hand feeding had to be resorted to. In preparing the soil for the next season's crop fallowing should be commenced as soon after seeding as possible, and the land kept thoroughly cultivated right up to the commencement of spring. If the weeds still made an appearance, the sheep could be relied upon to keep them in check. Practically the whole of the land in that district was devoted to the growing of hay crops, and seeding should be undertaken from the end of April up to the last week in May. One bushel of wheat, with  $\frac{1}{2}$  bush. of oats and from 1½ cwt. to 2 cwt. of manure, should be sown to the acre. Care should always be taken to select seed that had been pickled the previous year, and in no case should smutty grain be sown. After the crop had been cut the land could be prepared to carry a crop of oats for feed. If the land was too hard to cultivate in the summer, it should be sown with peas after seeding, say, during June. The oats could be fed off by large stock and the peas harvested by the sheep. He also believed it to be a good proposition to top dress the grass lands with 1 cwt. of grass manure every two or three years. The paper concluded by urging farmers to take proper care of implements, sheds, harness, &c., and to keep the fences in good repair. The election of officers for the forthcoming year then took place.

#### VIRGINIA.

June 15th.—Present: 23 members.

**SHEEP ON THE FARM.**—Mr. P. Baker read the following paper:—‘It is not necessary nowadays to produce arguments to convince farmers of the benefit to be derived from the practice of combining the growing of cereals and the keeping of a small flock of sheep. Most farmers living within a reasonable distance of a market find it greatly to their advantage to keep either a small dairy herd or a few sheep as an adjunct to their wheat and hay growing. Many keep both, and find it a payable proposition. Mixed farming has come to stay, and it is well, for the old adage, ‘Do not keep all your eggs in one basket,’ still holds good on the farm as well as in other directions. Very often it is the sheep that pay the rent, when through low prices or other causes the main lines of farm produce do not show a profit over working expenses. I consider that for a farmer living within a reasonable distance of a good market the best and most payable proposition is to keep a flock of ewes, and breed and fatten lambs for market, and I shall confine my remarks entirely to that aspect of sheep raising. I consider the best type of ewes for a farm flock in this district is the Lincoln-Merino first cross. These make good mothers, and crossed with rams of some good mutton breed they rear a fine lamb, and, being of a quiet disposition, are more suited to small paddocks than the Merino. For rams, the farmer has a choice of several good breeds, but, personally, I consider the Shropshire as good as any. In selecting rams, particular attention should be given to shape. The ram should be of a good blocky type, well filled up in the breech, for a shapely carcass is an essential point in a fat lamb. Lambs, if possible, should never be short of feed; if they receive a check in their growth they become stunted, and never make prime lambs. Lambs thrive better on the weeds and herbage which grow on cultivated land than on the native grasses, probably because the former are more succulent, and cause the ewes to produce a greater flow of milk. To secure sufficient early green feed for ewes and lambs it is a good plan to sow catch crops on stubble land, especially on land from which a hay crop has been cut. A mixture of oats, rape, and white mustard will in most years give good results. Rape to do well needs to get away with late summer or early autumn rains, but the oats are generally reliable, and give better results than barley or rye. To get best results, and conserve the feed, it is a good plan to draft out the ewes with lambs at foot, put them in the best paddock of feed, and keep the balance of the flock on the poorer pastures. It will generally be necessary to resort to hand feeding for a few weeks in March and April. Oaten or wheaten hay chaff fed in suitable troughs or other receptacles will help to carry the sheep through this critical period. From 1½ lbs. to 2½ lbs. of chaff per sheep per day will suffice. One of the drawbacks to feeding on chaffed

hay or any other dry ration for any length of time is that the animals develop trouble with their digestive organs, and most of us in this district have at times experienced heavy mortality amongst our flocks from this cause. There are several remedies which suggest themselves. The first is a supply of green fodder, such as lucerne, to be fed to the sheep at least once a week. This is a splendid tonic to keep the stock in good health, but unfortunately, owing to the ravages of the lucerne flea, the growing of lucerne in this district appears to be doomed. A proportion of bran or linseed meal mixed with the chaff ration will also give good results, but this may prove too expensive to pay. I believe the true solution of this problem, so far as our own district is concerned, will be found in growing mangolds, and feeding them to the sheep in conjunction with dry fodders. One of the advantages of this crop is that it can be grown on land that is practically useless for any other purpose. Most farms in this district have at least an acre or two of salt, swampy land; here mangolds will thrive very well, and as they last more than one season they are a good stand-by for hard times, and I consider it will pay any farmer who keeps sheep to cultivate this very useful fodder. The last point with which I shall deal is the necessity for providing, if possible, adequate supplies of good water in each paddock. Sheep thrive best when they can get water whenever they want it, and when they do not have to travel long distances for it. They also need, and this is especially true of the long wool breeds, plenty of shade during the summer months; and it is a good plan to have a clump of shade trees near the water." Mr. Baker answered a number of questions, during which he explained that crossbreds were a sheep with a quieter disposition than the Merino. Merinos would run around a paddock, and destroy more feed than they consumed. The crossbred would defend its lamb against the attack of the fox. They were no worse fencers than Merinos, for sheep kept in well-fenced paddocks never worried the fences. To make lamb raising a paying proposition he considered it best to market them as soon as they were in good condition. He was of the opinion that the Merino gave the best percentage of lambs, but the progeny of the crossbred did best when marketed early, say, at three months to four months old. May was the best lambing month. To ensure good profits he considered the age for selling to be about three months to four months, and the best time for marketing about August. He would use the iron for tailing when the lambs were about two weeks to three weeks old, but a good deal depended on the weather. Sultry weather was not safe, because of the flies. Mr. Ryan disagreed with Mr. Baker's method of tailing. He was a firm believer in the use of the knife and swabbing with a kerosine rag after cutting. He contended that the iron was too cruel. Mr. Lang stated that in Western Australia the method of burning was disfavoured. He believed that the crossbred was the best class of sheep, but considered the Dorset Horn gave the best percentage of lambs. Further discussion elicited the fact that there was difficulty in securing the recommended class of ewes. As regards methods of transport, it was considered that the train was the best, but care should be taken not to crowd the sheep. Mr. Baker said if he only had 30 sheep to market he would prefer the train to the trolley for carriage. It was also more profitable. Dipping sheep was considered by the speakers to be payable, and contended that as a result the sheep did better.

#### WILLIAMSTOWN.

July 15th.—Present: 35 members and two visitors.

**ANNUAL MEETING.**—The following annual report was presented by the retiring Chairman (Mr. E. D. Powell):—"In submitting my report for the nine months this Branch of the Agricultural Bureau has been in existence, I will touch on the progress made in that short space of time. Our first meeting was held on October 29th, when it was decided to form a Branch. It was attended by the following members:—Messrs. Brown (convener), Powell, Norworthy, Hammat, Varley, Binning, Howarth, Mitchell, and Rix; and the number of members on the roll on June 30th was 63, an increase of 54 members. The attendance of members, on the whole, has been very good. We have had some excellent discussions on the papers given by members and friends at our meetings. They have been of an interesting nature and an educational value, which is the primary object of the Bureau. On November 26th our first business meeting was held, and Mr. Finnis (Secretary of the Advisory Board) attended and gave an address, 'The Objects and the Workings of Agricultural Bureau.' On Saturday, January 22nd, a trip of inspection of several orchards in the district was made, which proved of immense

value to those who made the trip, and I hope to see this made an annual fixture. Messrs. Powell, Norsworthy, Ross, and Rix attended as delegates from this Branch the Lower Northern Conference, held at Clare on February 9th, and they had the pleasure of introducing an important resolution, which will again be submitted at the Annual Conference in September—the appointment of an inspector of apiaries. Members also made a trip to Balhannah, and visited the cool storage plant, and also the nursery of Mr. Wicks, and we had a very pleasant outing. During the year we have held eight business meetings, one special meeting, and one committee meeting. I would like to express my best thanks to you for your courtesy during my term as chairman, and to the committee and secretary for their valuable assistance, and I hope you will extend to my successor and the new committee the same attention and kindly feeling during their term of office.” The election of officers for the ensuing term followed, after which Mr. W. Gilbert read a paper, “The General Synopsis of the Wine Industry.” A paper dealing with the subject, “The Right Breed of Poultry for Egg Production,” was also contributed by Mr. J. Varley.

LYNDOCH, June 16th.—The report of the committee appointed to supervise the pruning competition was received and discussed. The subject, “Rabbit Destruction,” was also brought forward, and members gave their experiences of the best methods to destroy the vermin.

ROSEDALE, June 15th.—The Director of Agriculture (Professor Arthur J. Perkins) visited the Branch, and delivered a lecture, “Viticulture.”

WILLIAMSTOWN (WOMEN’S), July 6th.—The Secretary of the Advisory Board (Mr. H. J. Finnis) attended the meeting, and delivered an address, “The Work of the Agricultural Bureau.” The Hon. Secretary (Mrs. G. Hammat) read the annual report, and the officers were elected for the ensuing year.

## YORKE PENINSULA DISTRICT.

(TO BUTE.)

KILKERRAN.

May 19th.—Present: nine members and three visitors.

CARE AND MANAGEMENT OF FARM HORSES.—Mr. B. Gregory, who read a paper dealing with this subject, said as the horses were the most important animals on the farm, they should receive every care and attention from the farmer. A good warm stable, built on rising ground, and supplied with drinking water, should be provided. The stable should be made to open to the east or north, to shelter the animals from the cold, bleak winds. If the stable was erected in the form of a letter L, the chaff house could be placed in the south-west corner, and time would be saved in carrying the chaff to the mangers. The stable should be waterproof and warm, but ventilation for the hot weather should not be overlooked. He did not favor the practice of tying the horses up in their stalls at night. By leaving them loose they were more contented, and could have a roll whenever they wished. A still better plan would be to have a small sheltered paddock opening off the stables, from which they could be brought in in the morning. When the horses were brought in from a long spell they should only be given light work for the first few days. Especially did that apply to young horses. He did not think it advisable to work a larger team than seven horses abreast; much better results would be secured by working the team on the tandem system. When a team containing from 10 horses to 12 horses was worked abreast the teamster had considerable difficulty in effectively managing the horses, and the animals, when turning corners, frequently trod on each other’s feet. The animals should be fed according to the work they performed, and on no account would he work the team longer than six hours without a feed and drink. Sore shoulders should be given every attention, and the health of the animals given every consideration. The paper was well discussed, and favorable criticisms were expressed by the members.

At a further meeting, held on June 16th, a paper, dealing with the “Bulk Handling of Wheat,” was contributed by Mr. C. Heinrich.

**DECENTRALISATION.**—On July 14th a paper on this subject was contributed by Mr. C. G. Heinrich. The speaker said it was to be regretted that people, instead of remaining in the country, were drifting to the city. The fact that South Australia depended largely on her agricultural and pastoral industries, and that no less than 52 per cent. of the population resided in the metropolitan areas, brought home very forcibly what a serious problem had to be faced in decentralisation. The question that presented itself was, "How can this drift of the people to the cities be prevented?" There should be a general reduction in prices if the people were to be encouraged to leave the cities. If the products of the man on the land dropped 50 per cent. in value, it was natural to expect a reduction in the necessities required for working the land. It could not be doubted that the farming community was working at a great disadvantage on account of the labor shortage, and the increase in the price of commodities was tending to decrease the value of products. The conditions of the Australian climates lent themselves so favorably to the production of practically every form of cereal crop that competition could be entered into with any part of the world. An argument such as that should tend to very materially strengthen the attraction of the claims of agriculture. Farmers should be able to enjoy all conveniences possible, and more attention should be given to education, especially in scientific methods of agriculture, for which purpose the Bureau had been instituted. Another factor that would stimulate a keener interest would be the keeping of high-class stock. Mixed farming of all descriptions should be given a stimulus, and the disposal of produce determined by experienced men on sound business and economic lines. Individually, such items as had been instanced seemed insignificant, but when taken together would assist in making the life of the agriculturist more attractive to those who would otherwise drift to the cities. A great responsibility rested on the shoulders of the man on the land, and each primary producer should do his utmost to make rural life an attractive and payable undertaking.

#### MOONTA (Average annual rainfall, 15.22in.).

June 25th.—Present: 20 members.

**CARE AND MANAGEMENT OF THE HEIFER.**—In the course of a paper dealing with this subject, Mr. G. E. Page said to give the heifer a good start in life she should be born in the autumn, so that the rearing would be completed with the arrival of spring weather. For the first two days she should have the pure milk from her mother. She could then be taken from the cow, and taught to drink, first receiving whole milk, about  $\frac{1}{2}$  gall. three times a day. That could gradually be diluted until the calf was finally given skim milk. She should then be turned into a small, well sheltered pasture paddock, and a drink of milk and water night and morning should prove sufficient. At the age of  $3\frac{1}{2}$  months she could be weaned from the bucket. At that stage it was best to place her in a paddock away from the homestead with other cattle of about the same age. Plenty of green feed and a good supply of water should always be available. It was important that the fences surrounding the paddock should be substantial, otherwise the heifer would in all probability develop into a "fencer." As the paddocks became bare it would be necessary to resort to hand feeding, and if the animal showed good development she could be mated at 18 months old. If possible, the service should be so arranged that the young cow would first "come in" during the spring months of the year. Time would be well spent in petting the young mother, for she would then be less troublesome when first coming to the bail, and if one needed to render her assistance she would not be so difficult to handle. The milking should be carried out with a swift, smooth, and even action, and it was essential that every quarter should be thoroughly stripped. If the heifer had been bred on right lines, and was treated in the way outlined as above, she should give payable returns from the start, but no cow should be condemned over her first lactation period. If she was milked regularly and thoroughly over the full nine months, she would repay her owner for the trouble and care he had taken with her. In the discussion that followed, Mr. J. Atkinson thought the heifer before calving should be kept in a paddock close to the house in order that she could be handled and quietened against the time when she came into milk. Mr. Cooper was of the opinion that 18 months was too young for the heifer to come into milk. The young cow should be at least two years old before she was mated. He spoke in favor of the use of milking machines. Mr. T. H. Polgreen expressed a preference for keeping pure breeds of cattle. Mr.



Martin thought one of the main points to be patience in handling the heifer. Mr. Wearing said the salient points in the successful rearing of the heifer calf were care, kindness, and good feeding. Mr. Cliff thought farmers should keep a better class of cattle on their farms. The farmer would materially benefit by keeping milking stock obtained from tested animals. Mr. Brinkworth would give the calves the best food obtainable, and keep them in a substantial enclosure close to the house.

### WESTERN DISTRICT.

BUTLER (Average annual rainfall, 16.61in.).

June 20th.—Present: 20 members and five visitors.

**MOST PROFITABLE COW FOR FARM USE.**—In a paper dealing with this subject, Mr. J. Owen said most farmers kept a few cows on their holdings, but the question as to whether they were a source of income to their owners depended to a very large extent on the class of cattle kept and the system of management. For that district the speaker favored a well-bred Jersey or Milking Shorthorn breeds. The dairying and cattle industries of that district were handicapped to a considerable degree by the lack of water, the distance from stock markets, and the high cost of steamer freights. To obtain the best results from the stock they should be secured from sires and dams of approved pedigrees; have access to plenty of water and good food; and be provided with proper shelter. If the cows were each given a kerosine tin full of hay chaff, with a liberal allowance of bran, and a small tin of copra or linseed cake every evening, they would come home regularly for their meals. If plenty of green feed was available there would be no need to supplement the chaff with concentrated foods. The teats should be washed both before and after milking, to prevent sore teats and assist in the production of a high standard product.

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## ELBOW HILL (Average annual rainfall, 11in. to 12in.).

April 23rd.—Present: seven members.

A paper dealing with the continuance of the Wheat Pool was contributed by Mr. S. V. Wake, and an interesting discussion followed.

**FARM PESTS.**—At a further meeting, held on May 21st, Mr. L. Pearce read a paper dealing with this subject. He said he intended to deal with only a few of the pests that the farmer had to contend against. The blowfly had proved a menace to the sheep industry, and for those animals that were struck with the flies he suggested crutching and swabbing with a mixture of tar and kerosine. Mice could be best checked in a haystack by the erection of concrete mouse-proofing, built on similar lines to those used on the wheat stacks. Wheat should be stacked on end, and the mice would not then do so much damage to the grain. Foxes and rabbits both needed careful attention. He advised the use of poison for foxes, and the ferret and destruction of the burrows for the rabbits. Clean fallow and careful cultivation was the only successful method of dealing with weeds. In the discussion that followed, Mr. Williams said he had used a bluestone solution for combating blowflies with good results. Mr. G. Wake agreed that it was a good plan to stand wheat on end, but that plan took up too much room in the barn. Mr. P. Wheeler had used phenyle for blowflies with good results, but thought the only way of successfully dealing with them was to crutch every sheep. Mr. T. Cowley said he knew the concrete mouse-proofing to be a success.

## ELBOW HILL (Average annual rainfall, 11in. to 12in.).

June 25th.—Present: seven members.

**FALLOWING.**—In a short paper dealing with this subject, Mr. J. Williams recommended ploughing land intended for fallow in that district to a depth of not less than 3in. A commencement should be made as soon after seeding as possible, and the land given an immediate harrowing. After leaving the land in its rough condition for a few weeks it could be worked over with a light cultivator to a depth of about 1½in. The speaker strongly advocated the use of the spring-tooth implement, because it tended to bring the clods of earth to the surface, thereby assisting in the prevention of drift, and at the same time in the consolidation of the seed bed. In the discussion that followed, the Hon. Secretary (Mr. P. G. Wheeler) said the main object in fallowing was to conserve moisture, and to do that it was necessary to make an early start, so that as much moisture as possible would be retained by the fallowed land. Mr. Wake thought the depth of fallowing should be governed by the nature of the season. If the season was a wet one the ploughing could be done fairly deeply. After the land had been ploughed the main object should be the securing of a firm seed bed. Mr. Ramsey favored ploughing with a bridle draught cultivator, and then working the same implement across the fallowing, especially where the soil was at all inclined to drift. Mr. Cooper was of the opinion that it was best to fallow the land to a depth of 3½in., and then work the harrows in order to obtain a smooth soil surface. The Chairman (Mr. T. Cowley) favored deep ploughing where it was practicable, but the depth should at all times be controlled by the nature of the soil one had to work. It was decided that the next meeting should take the form of an annual social.

## MOUNT HOPE.

June 18th.—Present: seven members.

**THE BLACKSMITH'S SHOP.**—Mr. H. H. Myers, who contributed a short paper dealing with this subject, said the erection and outfitting of a blacksmith shop was a necessity for the successful working of the farm. He did not think sufficient value was placed on a blacksmith shop on the farm, and for that reason farmers too often made the mistake of making the building too small. The site selected for the spot should be one to which any of the large machines or implements on the farm could easily be taken. The forge should be placed in the middle of the shop, so that one could work on it from any side. Shelves or drawers could be erected on either side along the walls, to hold the different sized bolts, nuts, nails, &c. If plenty of good material was available he would prefer a stone structure, as there was less danger from fire. The shop should be well lighted by windows, so that on a wet day work could be carried on without any inconvenience.

## MOUNT HOPE.

July 16th.—Present: nine members and visitors.

THE AGRICULTURAL BUREAU.—In the course of a short paper dealing with this subject, Mr. H. F. Myers thought that many of the farmers in that district did not realise the value and the benefits that were to be obtained from a membership of the Bureau. The Bureau was instituted with the idea of bringing the farmers more closely into touch with one another and with the Department of Agriculture. At the meetings of the Bureau the farmers were able to meet their fellow-agriculturists in a social way and discuss with them the various problems that had to be faced in the successful working of the land. The *Journal of Agriculture* was forwarded free of charge to each member, and the speaker held the opinion that the knowledge that the farmers gained through that medium was of immense value to the man on the land. He hoped that every member of their Branch would take an active part in the work that was to be done during the coming session, and do all in their power to make the Mount Hope a successful Branch of the Agricultural Bureau. The Hon. Secretary (Mr. G. A. Vigar) then presented the annual report, and the election of officers took place.

## ROBERTS AND VERRAN.

June 20th.—Present: nine members and three visitors.

HOW TO MAKE THE FARM ATTRACTIVE.—Mr. Geo. Drayton read the following paper:—The first thing that assists in making a farm attractive is a good house. A great deal of care should be taken when choosing the site. The land should have a down-hill slope, in order that the house will be kept high and dry. A stone house looks more pleasing than a house of iron. There should be a good fence enclosing the house, with space left for a flower garden in front, and a vegetable garden at the back or sides. This not only gives the place an attractive appearance, but a supply of fresh vegetables in season and flowers for house decoration will be very acceptable. About five acres of scrub should be left surrounding the homestead. If there happens to be no scrub in a suitable place, then trees should be planted. Sugar gums grow quickly, and are ornamental, besides making an effective breakwind. No place, however well built, shows to advantage unless there are trees and a garden growing nearby. Then attention should be given to the horses. A stone stable placed on high ground to obtain good drainage is to be preferred. The roof may be of iron or straw. In my opinion a good straw roof, well thatched, is much better than iron, and is also much cheaper, being warm in winter and cool in the summer. With regard to horses, The Clydesdale is a suitable and active horse for farm work, and as a rule a very hardy type. One of the most attractive things on the farm is a team of good horses, and they should be well cared for. If the chaff house is situated on the end of the stable, with a door opening into a passage way behind the manger, it will prove convenient for feeding the horses. The manger should be from 18in. to 20in. deep, and made of sawn timber and iron, to permit feeding with chaff or hay. The barn should have stone walls and iron roof, or all iron, with a floor of timber or concrete. Space should be studied so that each different kind of grain could be kept in a separate place. If plenty of room is made between the bags, mice and weevil will not trouble them so much. The barn should be well ventilated, and have windows or skylights, and at least two doors—one on the ground level and the other on the level with a wagon floor. The implement shed is best covered with a wide-spreading straw roof, in order to throw the water well clear of the machines. Each implement, after being finished with in the paddock, should be thoroughly overhauled and repaired before being put away, to be ready when again required. Implements in good working order are pleasing to work, especially if painted frequently. Paint will add life to an implement by keeping the rain out and preserving the wood. Good fences are a valuable asset, and every farmer should endeavor to have his boundaries well fenced. Two barbs and three plain wires make the best boundary fence. The first plain can be placed 7in. from the ground, and all the other plain wires the same distance apart. The first barb should run through the centre of the post, and be 10in. above the third plain wire, and the second barb can be fastened on top of the post. This makes a good strong fence, that with a strain now and then will last for many years. A herd of pure-bred cattle is very attractive, and should, with a little care, pay well for the time spent on them. They require a good shed to stand in while being milked, being

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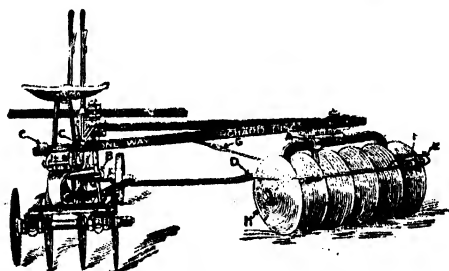
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better for the person milking as well as for the cow. A cow that has to stand out in rainy weather cannot be expected to give high returns. Pigs may be reared on the waste milk and grain. Their sty should be built with stone walls and straw roof, and they should have plenty of room for exercise. About half an acre of ground planted with rape or other fodder will provide quite a lot of green stuff for pigs, and will keep them healthy. Fowls are an asset, and are very attractive where good breeds and healthy birds are kept. Sheep are one of the main products on the farm, producing mutton and wool. The Merino is the most profitable type for the farm, the wool being the best standard quality. Then the condition of the soil is an important factor on the farm. The ground should be ploughed early, and worked after rains. After ploughing the fallow should be harrowed down and cultivated, and kept free from weeds. A good clean fallow looks very attractive. After work comes play. A tennis court can be easily made, and provides a great deal of pleasure for young and old. Week-ends should be free while the busy times are over, as break from toil gives one fresh heart for the coming week, and greatly assists in making farm life attractive to both young and old. In the discussion that followed, Mr. H. C. Videon said if farmers followed the lines laid down by Mr. Drayton they would have both bodily and mental comfort. Without these a farm appeared unattractive to the owner, who consequently did not put his best into his work, and to outside individuals the lack of enthusiasm and neatness was also noticeable. Mr. A. T. Cowley said if the buildings, fences, implements, &c., were kept in trim order they gave the homestead a pleasing appearance. The care of good stock was more interesting than the keeping of ordinary ill-bred animals. He advised having the home situated in the most attractive part of the farm, and be easily accessible to the fields and roads. Mr. F. Masters said one of the first things the farmer should give attention to was that of securing personal comfort. Without that their work appeared dull and uninteresting. The flow of youth to the city, he believed, was largely due to a lack of understanding on the part of the farmers. Quality in stock was the chief feature that made the farm attractive. Mr. B. Evans was of the opinion that it was an essential point that the farmer should map out a plan of work some months ahead. By doing that one would be prepared for the busy times, and know how much time could be devoted to recreation.

#### SMOKY BAY (Average annual rainfall, 13.06in.).

June 18th.—Present: 11 members.

The Hon. Secretary (Mr. W. J. Blumson) read a paper, "Education." In the course of the paper the speaker told of the many difficulties that confronted the education of the children of the settler in the outback hundreds of the State. In their district several of the farms had been abandoned on account of the lack of educational facilities for the children. In some cases children on the West Coast travelled 20 miles a day in attending school. He believed that the drift of the population of the country to the larger towns was due in no small way to the lack of schools in the pioneering districts of the State. A discussion took place concerning "Pickling of Wheat." Mr. Osborne stated that he had pickled wheat infected with smut in a bluestone solution, using an iron cement drum to hold the wheat whilst pickling, and the resulting crop was free from smut. Questions were asked and answered concerning harrowing of crops.

KOPPIO, June 20th.—Mr. C. Barraud contributed a paper, "Orchards and Orchard Work," and a lengthy discussion followed.

LAKE WANGARY, June 19th.—Mr. P. L. Puckridge contributed a paper, "The Lambing Season." The paper was taken from the handbook, "Beef, Mutton, and Wool for the Farmer," compiled by Mr. W. S. Kelly (Vice-Chairman of the Advisory Board of Agriculture).

MILTALIE, June 18th.—A paper, "The Improvement of Farm Livestock," was read by Mr. A. M. Wilson. Matters concerning the arrangements for the annual meeting were also brought before the members.

MINNIPA, June 8th.—The meeting was devoted to a discussion on the subjects for discussion at the forthcoming Annual Congress. Arrangements were also made for the annual meeting.

**MINNIPA, July 6th.**—Matters relating to the forthcoming Conference of Eyre Peninsula Branches were brought before the meeting. Several new members were added to the roll of the Branch.

**YADNARIE, June 15th.**—The annual report was presented by the Hon. Secretary (Mr. J. H. Kruger), and the officers were appointed for the ensuing term. A paper, "Chaffcutting," was read by Mr. J. H. Kruger. The following dates of meetings were selected for the current year:—August 16th, September 13th, October 18th, November 15th, December 13th.

**YEELANNA, June 18th.**—Mr. F. Proctor read a paper, "Seeding." Farmers dealing with sandy ground agreed that 60lbs. of super was sufficient, and that such land did not respond to a heavier application. On the heavier soils up to 112lbs. was advocated.

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## EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES).

**CLAYPAN BORE** (Average annual rainfall, 16in. to 17in.).

July 18th.—Present: six members.

**THE FARM VEGETABLE GARDEN.**—Mr. A. Bickford, who read a paper on this subject, said the cultivation of a vegetable garden was too often a neglected part of the working of the farm property. In reality, it should be considered one of the most important side-lines of the homestead. As a means of keeping down living expenses and assisting in keeping the people on the land in good health it should not be overlooked. While admitting that the sowing of the crops was their first consideration, he did not think an occasional day devoted to the care and planning of the vegetable garden would be very greatly missed. The main trouble seemed to be a shortage of water at the beginning of the season to keep the plants going. The remedy for that was, of course, a greater conservation of water, and while it might be argued that the garden was not of sufficient importance to warrant the extra outlay, yet he believed the cultivation of the vegetables would soon pay for themselves. The mistake should not be made of planting a large quantity of the same seed at the same time. A much better plan was to plant small quantities at different intervals, so that one would have a constant supply of vegetables on hand. It was also necessary to select a good piece of soil, and one that was handy to the water supply. An interesting discussion followed.

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## MONARTO SOUTH.

June 18th.—Present: nine members.

**PREPARING FALLOW FOR SEEDING.**—In a short paper dealing with this subject, Mr. J. Hartmann said to prepare the fallow for seeding the cultivator should be run over the land after the summer rains to destroy the weeds. There was nothing to be gained by working the land when in a dry condition; it was better to wait for the first rain, when one good working would be sufficient. Land that was not fallowed should be closely grazed with sheep the year before it came under crop. Early varieties of wheat sown for hay should be drilled in  $\frac{1}{2}$  bush, heavier than ordinary wheats, as they did not stool out so well. That portion of the crop set aside for the hay should be rolled as soon as possible after rain. An interesting discussion followed.

**PARILLA WELL** (Average annual rainfall, 16in. to 17in.).

June 20th.—Present: eight members.

**FALLOWING.**—Mr. H. T. Austin, who read a paper dealing with this subject, suggested that for fallowing flat country in a wet season the land should be worked to a depth of 3in. or 4in., but during a dry year the soil should not be ploughed to a greater depth than 2 $\frac{1}{2}$ in. He believed that the deep ploughing of wet land had a tendency to check the spread of take-all, and it also helped to conserve moisture for the following season. In dealing with a sand hill, the speaker was of the opinion that such land could be worked in either a dry or wet condition, because of the loose nature of the soil. He recommended the use of an implement

with a light draught. For the subsequent working of the land the speaker favored the use of a set of sharp harrows, and these, in conjunction with a flock of sheep, would do much to destroy the weeds and compact the soil. If the weeds made an appearance during the spring of the year he preferred the use of a cultivator, but the implement should not be worked at too great a depth, or the seed bed would be disturbed. In the event of rains falling during the summer, the harrows should be run over the land. When sheep were purchased, the speaker thought it a good plan to endeavor to secure them from clean country, in order that the distribution of harmful seeds might be reduced to a minimum.

#### RAMCO.

June 22nd.—Present: 19 members and visitors.

**SPRAYING.**—Mr. F. G. Rogers initiated a discussion on the subject, "Compulsory Spraying." The question of the best pumps to use was also brought forward. Mr. Lewis stated he had received a circular illustrating a spray pump which was driven by the wheels of a cart, acting as a sprocket. It was fitted up to do two rows of vines at once. Mr. Darling spoke of the hand spray outfits, and favored the knapsack type, which was carried on the back, and did real good work. Mr. Rogers considered the main thing in spraying machines was a good agitator, otherwise with certain sprays the solution would scald the trees.

**REMARK** (Average annual rainfall, 10.93in.).

June 23rd.—Present: 35 members.

**PRUNING THE PEAR TREE.**—The Manager of the Berri Orchard (Mr. C. G. Savage) attended the meeting, and read the following paper:—If one tree grown along the Murray Valley seems to present greater difficulties than another in the matter of pruning, I think you will readily agree that it is the pear, and especially the variety known as the Williams. The question of pruning is not such a difficult one when one studies the tree and its fruiting habits in the early stages of its growth, for if close attention is paid to the formation of the tree and the proper furnishing of fruiting wood in the first few seasons, little difficulty is encountered in later years. The matter of the proper treatment of the pear tree is of vital importance to dried fruit settlements, for I believe that the dried pear has a great future before it; for it is but a question of time for the public to realise what a delightful article the well dried Williams pear is. To gain the confidence of the public, both here and overseas, growers must be prepared to do their utmost to place upon the market a bright, clean, well cured product. **Shaping the Tree.**—The Williams pear tree if left to itself grows into a more or less pyramid shape, with a tall, strong central limb towering through the tree. This to a great extent describes the shape of very many of the pear trees, especially those of comparatively recent planting one sees in our river districts, for in many instances the trees receive but little pruning. In pruning the pear tree two systems are followed; one in which the tree is formed to a pyramid shape, and the other a vase shape. Of the two systems I prefer the latter, which allows of easy picking of the fruit, pruning of the tree, and the fighting of diseases and pests. In this hot climate one must be careful not to open the tree too much, but to see that the branches are well covered with healthy foliage to prevent the direct rays of the summer sun from shining directly upon the bark of the tree. Low headed trees are preferable to high headed ones, as, in addition to the advantages claimed for the vase-shaped tree, the low headed trees also have the advantage of being able to withstand the effects of strong winds to a greater extent than the trees that are headed high, and the stem of the tree is well shaded by the foliage from the sun. For general purposes trees headed back to within 15in. to 18in. of the ground will be found to be of a right height for most conditions. The greatest difficulty one experiences in pruning many of the growing varieties of pears is to spread the limbs out wide enough. Care must be taken to see that the limbs are not spread too wide, as the wood is not as stiff as that of the peach and apricot, and when laden with fruits there is always a tendency for the limbs to spread out. If the leaders are cut just above an outside bud with the object in view of forcing the top growth in an outward direction, the object will probably be defeated. The resulting growth from the topmost bud, especially on a strong shoot, usually grows rapidly in a vertical direction. To open the tree one of the following methods may be adopted. Where possible do not cut directly to a definite bud, but rather

to a suitable lateral, if one can be found growing in the direction it is desired to continue the branch. This lateral may then be cut to a definite bud. The second method is cut the leader to an inside bud. The topmost growth, growing straight up, forces the growth from the second bud to take an outward bend before growing up. The top growth is removed during late summer or at the next winter's pruning. The same object is obtained by cutting well above the bud to be left to continue the leader, so as to leave a dead stub. This stub has the tendency to force the growth of the leaders outwards, the dead piece of wood being removed at the next winter's pruning. The third method is to allow some of the central shoots to grow for a year or two, giving them a very light pruning. This tends to force some of the lower outside growth into a more or less spreading habit. These shoots should be cut to outside buds to form the future framework of the tree; or, if not growing at a wide enough angle, they may be pruned to suitable laterals as before described. The central shoots should be removed by a gradual shortening back; this is preferable to a total suppression in the one operation. If these shoots are cut straight out at their base, one must be prepared to summer prune, as many strong wood shoots will arise from around the wounds. These growths, if not suppressed during the summer, will soon crowd the centre of the tree, blocking out both sun and air, and thus preventing the ripening of the fruiting wood on the inside of the branches. The full-grown tree may carry from 10 to 15 leaders, according to its strength. The permanent fruiting wood being in the form of short spurs, there is not the necessity for leaving the wide space between the leaders as there is in the case of the peach and nectarine for successful development of the fruiting wood. The Fruiting Wood.—In many instances the development of the fruiting spur of the pear is as follows:—The first season the wood buds. From this grows a short wood or fruit spur during the next summer. In the case where a wood spur grew, it next season develops into a fruit spur. The object of the pruner is to clothe the arms of the tree in fruit spurs, and while so doing take from the tree, if possible, payable crops of fruit. If one studies the buds of a pear tree one finds a somewhat developed wood bud, rather pointed at the apex, and a large round fruit bud. The fruit bud of the pear is perhaps one of the easiest of fruit buds for a beginner to distinguish. Having noted the difference between the wood and the flower bud on an old tree, on the examination of a young, vigorous tree, even though no fruit spurs are found, many flower buds may be noted on the apex of the many lateral growths that have developed during the summer. Growers often cut away these laterals in pruning, thus cutting off the only chance of a crop from the young tree. The resulting growth from the suppressed shoot may develop either into a short lateral, which may or may not be tipped with a fruit bud. As many of these laterals should be left unstopped as is convenient for the development of the fruiting wood and the general growth of the tree. Flower buds at the apex of the laterals open, and clumps of pears are produced; the weight of the growing pear causes the somewhat slender shoot to bend downwards. The bending of the lateral causes many of the buds to burst into short spur-like growth, which will develop into fruit spurs. The lateral is then shortened into the desired number of spurs. This method of treating the fruit wood is condemned by some growers, because much of the fruit is liable to be damaged and knocked off the swaying shoots during wind storms. While admitting this disadvantage, this method will still produce payable crops on young trees which would yield but little if the laterals are shortened in. The great advantage to be gained is the development of healthy fruit spurs to carry future crops. To Bring Strong-growing Trees into Fruit.—In some instances after the first five years, where the trees are well shaped but are still growing strongly, they may be showing little signs of producing good fruiting wood. These trees should be given a light thinning during the winter's pruning. This will tend to aid the development of fruiting spurs, and the leaving of the leaders "unstopped" will help to retard the vigor of the tree, causing it to come into fruit bearing. In other varieties it is at times found necessary to prune out a fair proportion of the fruiting spurs, as in the case of the Winter Nelis. For though the tree may be clothed in good fruit spurs, and may even flower well, the fruit does not develop. The cutting out of some of the spurs causes the remaining ones to set their fruit, and payable crops result. Treatment of the Fruiting Wood on Old Trees.—As the tree increases in age, and has borne many heavy crops, spurs are developed freely over the tree. These spurs if left untouched will probably bloom freely, but the strain upon the tree will be too great, with the result that only a light crop will be carried.



# AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

## CONFERENCE of PINNAROO LINE BRANCHES

TO BE HELD AT

PARILLA, THURSDAY, AUGUST 25th, 1921.

### A G E N D A .

#### MORNING SESSION, 10.30 a.m.

OPENING ADDRESS .. .. .	—
PAPER .. .. . "Preparation of a Seedbed." ..	MR. E. T. TROWBRIDGE (Latteroo)
ADDRESS .. .. . "Dairying." .. ..	MR. P. H. SUTER (Dairy Expert)

#### AFTERNOON, 2.15 p.m.

PAPER .. .. . "Takeall." .. ..	MR. E. H. PARSONS (Pinnaroo)
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#### FREE PARLIAMENT—

##### QUESTIONS, &c.—

To be replied to by the Director of Agriculture .. .. PROF. A. J. PERKINS

(1) On what grounds did the Government prohibit the manufacture of bone super?

(2) Is it advisable to use lime in this district, and what is the method of applying same?

(3) When ewes are young and in good heart, and the rams which are in good condition are put with them early in November, how is it that the lambs do not come until the month of June? Can you suggest a remedy?

##### RESOLUTIONS—

- (1) { Wilkawatt — (Mover, Mr. W. F. Bowman). "That this Conference favors a series of lectures and demonstrations along the Pinnaroo Line by Government Veterinary Surgeons."  
Pinnaroo—"Veterinary requirements for outlying districts."

(2) Wilkawatt—"That this Conference favors the establishment of a Southern Port as an outlet for Primary Land Produce."

(3) Pinnaroo—"That this Conference favors a flat rate for the Carriage of Wheat over all Railway Lines."

PAPER .. .. . "The Advisability of Using Pure Bred Sires for All Kinds of Stock." ..	MR. J. GRAY (Claypan Bore Branch)
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#### EVENING, 8 p.m.

LANTERN LECTURE .. .. "The Economic Value of Bird Life." ..	CAPT. S. A. WHITE, C.M.B.O.U.
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When the tree reaches this stage the pruner should select the best fruit spurs, and retain them, and cut out the others. This treatment will tend to invigorate the remaining spurs, and good yields of fruit will be harvested. This method of treating the fruiting wood should be followed up systematically each year, in order to assist the tree in bearing regular crops. Spasmodic pruning is usually followed by irregular crops. A Practical Demonstration.—The principles enunciated by Mr. Savage in his paper were put into practice on a well-grown 10-year-old pear tree, cut down for the occasion and transported into the hall by Mr. Basey. The pear was of the Williams variety, and represented a type of growth to be found in many river orchards. It had been allowed to grow unchecked, and had assumed the pyramidal form natural to this tree. The leaving of the central leaders, the lecturer pointed out, had forced the subleaders well out, but they had not been attended to. The treatment suggested was to gradually reduce the central leaders. In making the saw cut to effect the necessary reduction, Mr. Savage demonstrated the wisdom of starting with a cut at the back of the branch, so as to avoid the stripping of the bark that sometimes follows a single cut. The main central limb was cut back to a strong lateral, situated about 9 in. above the fork selected for the final reduction, and the sub-leaders were cut back to good outward-growing laterals. The lower laterals were cut back to spurs—to fruit spurs where these were available, to wood spurs otherwise. One leader was cut back to a bud, because it was not in a good position, and the stronger leaders were left untopped. One was cut to about 1 in. above a bud, in illustration of the practice of leaving a stub for the purpose of turning the resultant growth outwards, and it was explained that the stub would be cut away next year. Spurs on the leaders were left untouched. In reply to questions, Mr. Savage said that as much lateral growth as possible should be left uncut. Where young branches were topped by, say, four fruit spurs, it would be regarded as good practice to thin out the centre ones, and leave the two outer ones untopped. To cut back hard meant to induce strong wood growth. The knobs found on laterals were commonly due to a whorl of leaves, and if cut through, fruit spurs should develop from the cut. They should aim to get a broad-based tree, and limbs that were too long should be shortened back gradually. Sunlight and air, filtering through the leaves, were necessary to produce a proper furnishing of fruiting spurs. Undeveloped buds on main branches could probably be induced to start by a half-moon cut above them. If a decent frame could not otherwise be obtained, it was sometimes advisable to tie the limbs in position. If there was time in the summer a lot could be done by the shortening of laterals at this season to improve the furnishing of all fruit trees. When summer pruning, it was better to cut the laterals than to fracture them. To form a young tree, cut back the first year to a straight stub, just below knee height. Stand over the young tree at the next year's pruning, and judge what limbs should be left to fill out the circle, and then cut to four limbs. Cut the weak ones back hard, the others not so hard. The three or four limbs left the first season should be cut to side buds to encourage subdivision, so as to fill in the circle. After the first year there would be six to eight limbs left. If the tree was well developed at this stage, cut back to one terminal on each leader, and if a leader was very strong, it could be left untopped.

#### TAPLAN.

June 24th.—Present: seven members.

VERMIN DESTRUCTION.—“Of the four pests that we in this district are troubled with—the fox, kangaroo, wild dog, and rabbit—I believe the last-mentioned to be the most formidable,” said Mr. E. H. Schulze, in a paper under the above heading. The speaker held the opinion that the best method of destroying the rodents was by using the poison cart immediately after the first rain after harvest, and then filling in the burrows. Should any remain after that, a pair of good working ferrets should be secured, and, with the aid of a dog or two, the rabbits could be kept well under control. So long as there were plenty of rabbits about, very little was heard of the fox, but when rabbits became scarce Reynard usually attacked lambs and poultry. Should he not get sufficient of these, then he readily tackled full-grown sheep. The best way to destroy the fox was by laying baits, poisoned with strychnine, around a carcass that had been killed the night before. Pieces of liver or small birds made good baits, but great care should be taken, when liver was used, to make the baits very small, so that the fox would not drag the

bait away, and only eat portion of it, and leave the rest to poison domesticated dogs. The wild dogs in their district were usually tame dogs gone wild, and were much more destructive than the dingo, and more difficult to destroy. In his opinion, the only method of destroying them was by organising a general hunt, with all the fighting dogs in the neighborhood. The kangaroo could hardly be classed as "vermin" at the present time, for, so soon as the country was cleared of timber and became inhabited, the kangaroo decided to "move on." Mr. A. C. Barton, in opening the discussion, said he had recently ploughed in a number of rabbit warrens, but in a little while the rodents had opened them up again. Mr. P. R. Hodge thought the poison cart the best for destroying the rabbits. He advocated concerted action on the part of neighbors, whereby the poisoning would be done simultaneously. Mr. A. H. Schulze had found the breaking in of the burrows with a pick, and then placing a trap at any hole that was opened, very effective.

WILKAWATT (Average annual rainfall, 16in. to 17in.).

June 18th.—Present: eight members and two visitors.

FALLOWING.—Mr. F. R. Koch read the following paper under the heading "Fallowing in Our District":—We have sufficient evidence in circulation proving that fallow is the only sure means of securing maximum returns from the land over a period of years. I favor early fallow, and one should carry on from seeding to ploughing, providing weather conditions are suitable. In this district, where our subsoil is close to the surface, 2in. to 2½in. is, in my opinion, quite deep enough to plough; following on this, harrow down, cultivate with a tyne cultivator in spring, and give as many subsequent workings as weather and moisture permit. Where the land is free from bushes and sticks, a spring-tooth cultivator does very good work, and a large implement is a labor and time saver. Sheep are great helpers in making good fallow, acting as land packers and weed eradicators. Mr. E. A. Altus read a paper, "The Disadvantages of the Outback Settler," in which he enumerated some of the obstacles that had to be overcome by those doing pioneering work. Special emphasis was laid on the difficulties faced by those settlers whose blocks were situated at a considerable distance from the railway station, and the time that was lost in carting the produce over long distances. The Hon. Secretary (Mr. F. H. Koch) read the annual report, and the officers were appointed for the ensuing year.

WILKAWATT (Average annual rainfall, 16in. to 17in.).

July 17th.—Present: seven members and visitors.

METHOD OF WORKING A MALLEE HOLDING.—Mr. W. H. Phillips, who contributed a paper on this subject, said the first point the new settler had to consider was the water supply, and no time should be lost in sinking a bore or making other preparations for the conservation of water. Next, the house, stables, and implement sheds should be constructed. For the first year he suggested rolling down 250 acres of scrub during September, for by so doing one would be able to destroy the first growth of shoots during the burning season. Immediately after the fire the plough should be started, and the ashes worked into the soil. If early rains were received, an opportunity should be taken of working the land with the harrows. If the land was at all inclined to "set hard" it would be as well to work the cultivator before the drill. Of the 250 rolled acres, 50 should be sown with oats, and provided the land had been well cleared of snags, that portion of the crop could be cut for hay. The remaining 200 acres could be sown with hard wheats. During the second year an endeavor should be made to roll 300 acres, and to sow it with wheat. The stubble land from the first 250 acres should, if possible, be burnt, and drilled with oats. If the 250 acres was divided into two paddocks, one could be used for grazing, while the other could be reaped. The third year another 300 acres should be rolled and burnt, and put under wheat. The land that had carried the oat crop the first year could be fallowed, while the stubble from the second crop should carry equal areas of oats and wheat. If the farm was worked on that system there would be very little to be feared from take-all, as one would always have the oat land to fallow each year after it had carried the first crop. On no account should wheat be sown more than twice in succession. After four years of such working the property should be ready for the adoption of the rotation of crops.

## WYNARKA.

May 21st.—Present: 10 members.

**QUESTION BOX.**—The following questions were asked and answered by members:—What time should elapse between drilling and harrowing? Mr. Hall was of the opinion that harrowing would not interfere with germination even if the wheat had shot. If the season showed signs of light rainfall it might be well to harrow early to conserve moisture. Is wheat likely to be infected by smut being in the ground? Messrs. Yeates and Richardson thought not, as self-sown wheat very seldom showed signs of the disease. Is wheat sown immediately after pickling more liable to smut than if kept three weeks before drilling? The general opinion was that the immediate sowing of the grain after pickling did not check the development of smut. Is pickled wheat sown while still damp liable to malt if sown in dry ground? Mr. Richardson did not think the seed would retain enough moisture to cause trouble. A paper was read by a member at a further meeting, held on June 25th.

## YOUNGHUSBAND.

May 19th.—Present: five members.

**FARM CONVENIENCES.**—Mr. Mann, who read a paper on this subject, said he selected the above question chiefly because of two facts; first, because on the average mixed farm every person, including the children, had to take a share in the work; and also because that, although South Australia was essentially an agricultural and pastoral country, 55 per cent. of the inhabitants resided within a 10-mile radius of the capital city's boundaries. The lack of farm conveniences he believed to be a factor that contributed in no small way to the drift of the country population to the city. The women folk on a mixed farm were frequently called upon to do more than household duties, and in order that their work might be made as congenial as possible, nothing should be overlooked that would assist in a saving of labor. For the kitchen the speaker suggested the erection of built-in wash troughs and a copper and tap in the separator room. A supply of water laid on to the cow bails; and a small plot of land adjacent to the house for the cultivation of flowers would also be welcomed by the women folk. Referring to labor-saving devices for the men folk, the writer of the paper first mentioned that much could be done to improve the feeding arrangements in the stable. Where there was a passageway of any length behind the mangers, a small trolley or tramway, with a large box attached to it, could be called into operation. A trough in the stable yard also saved time in the watering of the animals. Gates that were frequently used should be made of a substantial nature, and constructed with wood or iron. Panels in the fences could be made with wire, and if a couple of droppers were used they would prevent the wires from becoming tangled. The social side of the farm should not be overlooked, and a reasonable amount of time could be devoted to any of the various forms of recreation. An interesting discussion followed.

**SHEEP.**—At a meeting, held on June 23rd, a member contributed a paper, "The Value of Sheep on the Farm." The speaker voiced the opinion that sheep were not only one of the most valuable assets for the mixed farmer, but they were also a necessity to the successful working of the holding. The number of sheep to be kept depended, of course, on the size of the holding, but he thought a farm with an area of 1,000 acres should easily carry from 150 to 200 head. If the best results were to be obtained sheep-proof fences should be erected. It was sometimes argued that such fences were too great an expense, but to do justice to the animals the farm should be subdivided into small paddocks. If the fences were not substantial the sheep would soon prove a nuisance. Nothing caused friction between neighbors more than trespassing stock. For a small flock he suggested securing sheep of the Merino breed. They were quiet dispositioned, and did not run about over the land and cut up the feed. Good animals would always cut a payable fleece and bring a profitable price when placed on the market. Sheep were invaluable as weed destroyers, and unlike other forms of stock, seeds were not distributed by their droppings. Sheep manure was a valuable fertiliser. When allowed the run of the fallow paddock sheep kept the weeds in check and added humus to the soil. In addition to that, they compacted the soil, which helped to conserve the moisture and assisted in the preparation of a good seed bed. The following remarks were

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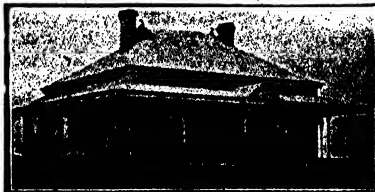
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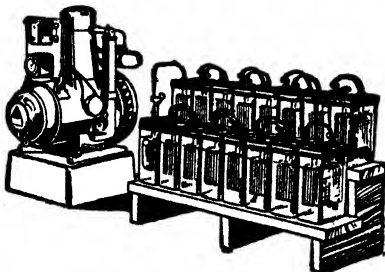
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made by the speaker in regard to the purchasing of a small flock for the beginner:—  
 "To buy, say, 150 well-bred young Merino ewes at the present time, one would probably have to pay 25s. per head for them; that would be an outlay of £187 10s. If they were kept for 12 months, the return for them would be, roughly, 150 fleeces, averaging 10lbs. of wool each, and sold at 10d. per lb. (which is a very mild estimate), £62 10s. Eighty per cent. lambs would be an increase of 100 sheep. If the lambs were half of each sex I would keep the best young ewes and cull out the older ewes and wether lambs, and sell them; that would be 100 sheep to sell at, say, 15s., each, £75; so practically the first year the return would be £137 10s., a very profitable investment on the outlay involved. Or, if one was to kill the ewes that were not in lamb for mutton the profits would appear a little less, but pounds would be saved during the year in the butcher's bill. In conclusion I would say that sheep on the farm do not make a lot of extra and hard work, as many other side lines do, and the work involved is very pleasant and interesting, besides being remunerative."

**BARMERA**, July 15th.—Mr. W. E. Muspratt (Irrigation Instructor) attended the meeting, and delivered an address, "Manures and Manuring."

**BERRI**, July 19th.—Mr. C. E. Halliday contributed a paper, "Sprays and Spraying," and a very interesting discussion followed. Messrs. Jarvis and Wilksch were appointed delegates to represent the Branch at the Annual Congress.

**BRINKLEY**, July 16th.—Notice was received from the Hon. Secretary (Mr. Martin) that the members of the Branch had co-operatively purchased a grader. The annual report was presented, and the officers were appointed for the ensuing term.

**CADELL**, June 16th.—The Horticultural Instructor (Mr. Geo. Quinn) visited the Branch, and gave a pruning demonstration and lecture. Eighty members and visitors attended the demonstration.

**COONALPYN**.—The following programme of meetings has been received from the Hon. Secretary (Mr. F. Tregenza):—August 17th.—Papers, "Suitable Teams for the District," Mr. A. E. Gurner; "Farm Bookkeeping," Mr. C. P. D. Sleep. September 14th.—Papers: "Making Charcoal," Mr. H. Treeby; "Possibilities of Fruitgrowing Locally," Mr. F. Pitman. October 12th.—Annual homestead meeting and address by Mr. W. J. Spafford (Superintendent of Experimental Work). November 9th.—Papers: "The Mistake of Overstocking," Mr. F. Tregenza; "Colt Breaking," Mr. J. J. Cronin. December 7th.—"Notes on the Hay Harvest," members; paper: "Destroying Vermin," Mr. J. Angel.

**GLOSSOP**, June 15th.—The Horticultural Instructor (Mr. Geo. Quinn) visited the Branch, and gave a pruning demonstration on Mr. J. T. Robertson's block. In the evening Mr. Quinn delivered an address, "The Principles Underlying Pruning."

**KI KI**, June 30th.—Members discussed matters relating to the forthcoming Annual Congress. Other items of local importance were also brought before the meeting.

**LAMEROO**, June 18th.—Mr. E. J. Trowbridge contributed a paper, "The Preparation of the Seed Bed." An interesting discussion followed.

**MURRAY BRIDGE**, May 17th.—The Assistant Dairy Expert (Mr. H. J. Apps) attended the meeting, and delivered an address, "The Management and Feeding of Dairy Cattle."

**PINNAROO**, July 15th.—Matters relating to the forthcoming conference of Pinaroo Line Branches were brought forward for discussion. The Hon. Secretary (Mr. E. H. Parsons) presented the annual report, and the officers were elected for the coming term.

**ROSY PINE**, June 15th.—The meeting took the form of a "Question Box," when several items of local interest were brought forward for discussion.

## SOUTH AND HILLS DISTRICT.

CHERRY GARDENS (Average annual rainfall, 35.03in.).

June 21st.—Present: 15 members.

**ANNUAL MEETING.**—At the conclusion of the election of officers and the reading of the annual report, Mr. C. Ricks (a life member of the Agricultural Bureau) gave an interesting resume of the work of the Bureau, in which he traced the progress of the organisation from its early stages up to the present time.

## CYGNET RIVER.

June 16th.—Present—Five members and visitors.

**CARE OF FARM ANIMALS.**—In the course of a short paper dealing with this subject, Mr. F. J. Wakelin said the farmer who cared for his horses in a proper manner would find that the animals were more capable of performing their duties, and, in addition to that, it would be a pleasure to the teamster to look after such a team. Regular hours should be adopted for feeding and watering, and the animals housed in a warm and clean stable. The provision of well-fitting harness was also another important point in the wellbeing of the animals. The sanitary condition of the pig sties was a point that was too often overlooked on many farms. The pig was not a dirty animal, but when he was kept in small and filthy enclosures it was no wonder that he could not keep himself clean. He thought the pigs would be more healthy if they were allowed the run of a small paddock. Some little time before the sow was expected to farrow she should be placed in a sty by herself. It was not advisable to provide too much straw for the litter, as there was a danger of the young pigs crawling underneath it and being crushed by the sow. At a month to six weeks old the young boars should be castrated. During the suckling period the sow should be fed with plenty of skim milk, pollard, and crushed peas. Soaked wheat or barley was also recommended by the speaker. An interesting discussion followed.

GUMERACHA (Average annual rainfall, 33.30in.).

June 20th.—Present: six members.

**WATER CONSERVATION.**—Mr. A. V. Lee, who read a paper on this subject, said it seemed absurd to talk of storing water in a district that received such a heavy rainfall as theirs, yet every summer the gardeners anxiously looked for showers to refresh the vegetable crops. One or two wells in their district could be utilised, but that would mean the erection of windmills and large storage tanks, and he did not think any bore or well in that locality would stand continuous pumping. There was no doubt that their district was admirably suited for the excavation of private reservoirs. An ideal position for the reservoir would be in a gully running off from one of the grass-grown creeks. By selecting such a creek the grass would prevent a large quantity of silt from getting into the dam. A level situation should be chosen, so that the erection of a 10ft. wall would throw the water back for a distance of 100yds. The site should be as high as possible, in order that the water could be gravitated all over the holding. After the spot for the erection of the bank had been determined, a trench 2ft. in width and the whole length of the dam, should be excavated. The depth of the dam would, of course, be governed by the thickness of clay contained in the subsoil. Next, the plough and scoop should be called into use and the surface soil tipped behind the trench. So soon as good clay was reached the trench should be filled in. If the clay was dry, water should be added, so that the trench would be thoroughly puddled. When the damp clay was encountered in the course of excavating, it should be tipped on to the top of the trench. The horses and scoop constantly passing over it would make it set down very firmly, making it thoroughly watertight. The final point should not be overlooked, namely, that of providing a spacious overflow to carry away the surplus water.

**AGRICULTURAL BUREAU OF SOUTH AUSTRALIA****CONFERENCE OF SOUTHERN BRANCHES**

TO BE HELD AT

**PORT ELLIOT, THURSDAY, AUGUST 18th, 1921.****A G E N D A.****12 NOON.**

CHAIRMAN .. .. .	MR. J. HAMILTON WELCH
OPENING ADDRESS .. .. .	MINISTER OF AGRICULTURE (Hon. T. Pascoe, M.L.C.)
PAPER .. .. . "Purchasing a Farm." ..	MR. H. LEHMAN (Hartley)

**AFTERNOON, 2 o'clock.**

PAPER .. .. . "Irrigation." .. .. .	MR. J. BROWN (Port Elliot)
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**FREE PARLIAMENT:—**

- (a) RESOLUTIONS — "That the Government be recommended to simplify the income tax returns for farmers." } MILANG BRANCH

- (b) SUBJECT FOR DISCUSSION—Cost of duplicate parts of machinery. } MILANG BRANCH

## (c) QUESTIONS—

To be answered by the Director of Agriculture. } PROF. A. J. PERKINS

(1) What is the best breed of lambs for export?

(2) What is the best cereal, wheat, oats, or barley to grow on light, sandy soil?

To be answered by the Poultry Expert .. MR. D. F. LAURIE

(3) What is the best method of defining the age of fowls?

PAPER .. .. . "How I Work My Farm." ..	MR. W. H. GILES (Milang Branch)
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PAPER .. .. . "Are Artificial Manures Beneficial?"	MR. J. HAMILTON WELCH (Port Elliot Branch)
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**EVENING SESSION, 7.45.**

PAPER .. .. . "Olive and Pine Growing in the South."	MR. W. E. HAYMAN (Port Elliot)
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LANTERN LECTURE .. .. . "Forestry." ..	MR. H. H. CORBIN, B.Sc. (Lecturer in Forestry, Adelaide University).
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**HARTLEY** (Average annual rainfall, 15in. to 16in.).

June 15th.—Present: 17 members.

**THE SELECTION AND PURCHASE OF A FARM.**—In the course of a paper dealing with this subject, Mr. F. Lehmann said the careful selection of a farm and the talents and ability of the settler to carry on the work were two of the most important factors in the successful occupancy of the holding. One should first determine whether the property was to be worked as a wheat producing farm or whether operations would be carried out as mixed farming. The main points in the selection of the block should be soil, rainfall, distance from markets, and price. The last-mentioned would, of course, be governed by the foregoing points. The points that indicated soil fertility were color, texture, and depth. Dark soils were rich in vegetable matter and lime, and were usually regarded as the best soils. Underlying rocks could also be taken as a sign of the fertility or pooriness of the soil. Much also depended on the subsoil. Good clay underlying the surface layers of earth retained moisture better than soils with rocky or sandy subsoils. Heavy and sticky soils required more horse power to work them than light or sandy soils, but gave better returns in proportion to the work required, and where the rainfall was sufficient, the heavier soils were the most profitable. After having satisfied oneself as to fertility of the soil, the next point was that of the rainfall. A rich soil with poor rainfall was not so good an investment as a light soil with the same rainfall. The rainfall statistics should be examined to see how the rain was distributed. Where the averages were from 17in. to 20in. there should be no total failures of crops, nor should the number of stock vary to any extent. On the lighter sandy soils wheat could be profitably grown on light rainfalls, but its grazing capacity was inferior to the heavy soils. A water supply for livestock was an important item. Running streams through a farm could not be too highly valued. Wells with good water and windmills erected over them, gave a clean supply. Dams with good catchments were good, but were not dependable, on account of the variation in rainfall. Other items, such as fences, number of paddocks, house, stables, sheds, convenience of location, sanitation, and time saved in doing the work in connection with the different buildings, and their safety from fires, should receive serious consideration. Distance from markets also had much to do with the value of the farm. If the roads were bad, and long distances had to be covered, a lot of time and horse power were required in getting the produce to market, which meant that the farm horses were constantly on the roads. The best time to inspect a farm would be during the growing or crop ripening periods, as that would enable one to see the kind of grasses growing and the condition of the crops and fodders. If one intended carrying on a wheat-growing business the average yield of the district for a term of years could be ascertained by referring to Government wheat statistics. The average price per bushel for wheat at Port Adelaide, or nearest port, included with the grazing value for stock, would give the gross income of the holding. Next should be considered expenditure for stock and working plant, wear and tear of same, and seed, manure, taxes, and labor. After deducting expenses from income, there should be enough left to cover the interest on farm capital and plant, and an amount taken as salary or profit to the owner to allow for his labor and management of the farm.

**IRONBANK** (Average annual rainfall, 33in. to 34in.).

June 19th.—Present: six members.

**UTILISATION OF WASTE FRUIT.**—Mr. H. Tucker read the following paper:—“The attitude I adopt in writing this paper is that to turn waste fruit to profitable account it is best to try and eliminate the waste, and also that the only waste fruit it is possible to make a profit on is apples. In order to do this it is advisable to try and classify waste fruit, and I would do this under the following heads:—(a) Immature fruit that is crowded out of the tree when the crop is heavy; (b) windfalls, full-grown fruit but not matured; (c) windfalls, full-grown fruit matured; (d) fruit that is unsaleable owing to glut; (e) rejects. As regards (a) this is not of much account, as it is usually too small to have any value either commercially or as food for animals, and could be avoided by judicious thinning after the fruit has set. (b) and (c) Windfalls cover such a large range of fruit that I think they deserve further investigation, and I would classify them as follows:—

- (1) Sound fruit actually fallen through the agency of the elements, (2) fruit affected

by codlin moth, (3) fruit affected by scab. From close observation and experiments made during the past season I have come to the conclusion that not more than 10 per cent. of windfalls would come under the first heading. Sound fruit and particularly immature fruit, will stand a lot of shaking before it will leave the tree, which emphasises the fact that fruit must be kept clean, and this can only be done by spraying at the right time, using only reliable brands of spraying materials. It is fruit damaged by codlin moth and scab which compose most of the windfalls. The above remarks are made in order to define waste fruit, and to see what can be done to check the waste. As regards the utilisation of waste fruit, I can suggest five ways in which it might be turned into profit:—(1) Fed to animals, (2) sold to jam factories and dryers, (3) dried in the district, (4) commercial alcohol, (5) vinegar. During the past season I fed apples to my cows in large quantities, sometimes as many as 80lbs. per animal per day, but the benefits derived therefrom in regard to a greater flow of milk or milk of a higher quality were nil; in fact, unripe apples seemed to tend to decrease the flow. As far as pigs are concerned, waste apples, if ripe, are good for filling, but concentrated foods would need to be given as well; that is, if the animals are expected to fatten. The question as to whether it is profitable to send waste apples to the jam factories or dryers depends a great deal on the season and the export trade, as these two factors practically control the price that the factories will offer. If the price were no better than last season's, then, in my opinion, the fruit would be best left on the ground. **Drying Fruit in the District.**—This, I think, is the most practicable way of turning waste fruit to profitable account. It would pay best if a drying plant could be erected on a co-operative basis, all the fruitgrowers in the district being shareholders. In this way the outlay for each grower would be small, and each one would get the full benefit of all the fruit he treated. It is too big a subject to discuss in detail in this paper, but I strongly advise growers to give it serious consideration. **Commercial Alcohol.**—I mention this because alcohol can be easily manufactured from decaying vegetable matter, and denatured by the addition of formalin; but at the present time it would not pay owing to the heavy excise duty levied by the Commonwealth Government. To sum up—first of all check waste by careful spraying and pruning, and to cope with the waste, co-operate and erect a drying plant.

**LONGWOOD** (Average annual rainfall, 37in. to 38in.).

July 16th.—Present: eight members and five visitors.

**HOMESTEAD MEETING.**—The monthly meeting of the Branch was held at the residence of Mr. J. R. Coles. A most interesting and instructive afternoon was devoted to a practical pruning demonstration. Matters relating to the forthcoming Hills Conference were also brought forward.

**MEADOWS** (Average annual rainfall, 35.52in.).

June 15th.—Present: 10 members and visitors.

**THE MANGOLD.**—In a paper dealing with this subject, Mr. Smith said the farmer in the hills who had to derive his livelihood from a block ranging from 10 acres to 60 acres of land, consisting in the main of poor country with rich flats for intense culture, was often confronted with the question, "What shall I grow for fodder for the stock?" In the majority of cases such a blocker usually kept a few head of cows and pigs and a small flock of fowls. The speaker was of the opinion that for such a man, mangolds were the best crop to grow. They were a crop that on ordinary land would yield from 30 to 40 tons to the acre. If the leaves were carefully stripped from the plants they would provide a considerable amount of fodder for either cows, pigs, or fowls. The varieties chiefly grown were Long Red, Mammoth Yellow, and Orange Globe. The last-mentioned could be successfully grown on shallow soils, but the other sorts required deep soil. As regards the quality of the different kinds for fodder, the speaker said the Globe was to be preferred, because it was finer in the flesh, contained a larger amount of sugar, and consequently was more favored by the stock. If possible, the crop should be grown in sheltered gullies, and on land with a good drainage. Mangolds could be grown on any land in that district where it was possible to work a plough. He had grown Globe mangolds weighing 10lbs. each on very stony land. Such land, however, was not always desirable, for the stones provided harboring places for slugs, &c. Pig manure was a very valuable fertiliser for growing

mangolds. As a rule he secured his seed from a reliable seedsman, but one would obtain a better percentage of plants by saving the seed on the block. When the latter plan was adopted one should be very careful to avoid cross fertilisation from other plants. There were many ways of sowing the seed. Drilling with a machine or hand-drill was sometimes carried out; or the seed could be put in a furrow made with the plough and the earth harrowed over to cover the seeds. He favored planting the seed either in November or the beginning of December. If the seeds were sown earlier in the season, one should be prepared to do a considerable amount of hoeing. Almost any kind of fertiliser could be used, but as a rule he used guano super and lime mixed with fowl droppings. He had been successful both in transplanting and thinning out the plants. For Globes, he spaced the plants 21in. x 12in., and Long Reds 21in. x 16in. An acre sown under those measurements would make 37 rows, 10 chains long, with 660 Globes or 440 Long Reds per row. Such a sowing could reasonably be expected to yield from 72 to 76 tons to the acre. The speaker referred to the mangolds that he had tabled, one Long Red, weighing 16½lbs., and one Globe, weighing 10lbs. They were both planted on December 27th, 1920, and pulled on June 11th, 1921. The land from which the mangolds were taken had received no special attention, nor any artificial waterings. In the discussion that followed Mr. Ellis favored saving his own seed, as there would be a better percentage of plants, unless, of course, one could rely upon the seedsmen. Mr. Smith preferred late sowing, for one did not have the weeds to contend with; but, on the other hand, one had to combat the small green grub that attacked the plants when they appeared. Mr. Smith had secured results by scalding his seed before planting. The question was asked whether transplanting was successful. Mr. Ellis did not advise transplanting, because when the plants were ready to plant out the weather might not be suitable, and unless one could rely on a few damp days for the work, far better results could be obtained by sowing the seed in drills and then thinning out.

#### MENINGIE (Average annual rainfall, 18.87in.).

GARDENING.—At the annual meeting of the Branch Mr. W. H. Mincham, jun., contributed a paper on this subject. Gardening, he said, was interesting as well as profitable. A farmer who possessed several different classes of soil should be able to decide on a suitable site for a garden. He was of the opinion that the water supply should be considered more than the site, because a person could build up poor soils with manures, but it was difficult to overcome the defects and impurities in the water supply. It might contain too much magnesia, minerals, or soda, which had a detrimental effect upon the vegetables. Possibly a farmer would possess several wells on the farm, but one might be found more suitable to vegetable life than the others. A site with a slope towards the morning sun had many advantages. He thought a deep sandy soil without a subsoil would require a large supply of water, because the moisture would soak away quickly from the surface. During the summer the young plants should be protected by placing straw, rushes, or old stable manure between the plants. He would not advise watering the foliage in the heat of the day, because it would become scalded. When transplanting the plants should be carefully handled, and care taken not to bruise them, because that would cause withering. The young plants should not be placed in a vessel of water before transplanting because that would wash all the dirt from the roots, and cause them to cling together, which was not the natural position. When plants were to be mailed long distances they should be taken from the ground with the earth around the roots, and packed in moist packing. Pests and weeds should be kept under control, so that the farmer could confine his energies to the work which needed attention.

#### MOUNT PLEASANT (Average annual rainfall, 26.87in.).

July 8th.—Present: five members.

HAND FEEDING SHEEP.—The Hon. Secretary (Mr. C. O. Royal), who contributed a paper dealing with this subject, said one of the points worthy of the serious consideration of every flock master was the hand feeding of sheep, and especially the breeding ewes. In a season such as the one through which they were passing it might not be necessary to resort to hand feeding, but the bountiful rains and luxuriant growth of fodders should be taken advantage of, and provision made for those times when the country was not so abundantly blessed. Referring to the breeding

ewes, the speaker was of the opinion that if the mother was fed on good fodder for a month or so before the lamb was dropped, both the ewe and the lamb would be very much stronger, and better able to face the cold winter months. Early lambs were sometimes lost, and he believed that to be due to the fact that the ewes had not received sufficient nourishment from the dry grass to keep them in a strong and healthy condition. The speaker told of his experience during 1918. When the ewes commenced to lamb there was very little natural green feed in the paddocks, and quite a number of the lambs had died. He then commenced feeding the ewes with chopped piemelons, and after three or four days no more deaths resulted. Perhaps everyone would not be quite so fortunate as to have piemelons or green fodders on hand, so that feeding from the haystack would have to be resorted to. It was very seldom that they had to hand feed for more than a few weeks of the year, so that it would not be wise to go to the expense of constructing costly feeders. He thought that long hay placed in wire netting feeders was all that they required. The feeder could be 3ft. high, 3ft. wide at the top, and 1ft. wide at the bottom, with a 2in. gauge strong netting. All that was necessary was to cut the bands of the sheaves, and place the hay in the feeders. He preferred the hay to chaff for two reasons:—(1) One could not prevent a certain amount of chaff from getting into the wool of the sheep; and (2) the wind wasted so much of the chaff unless one went to the expense of erecting special feeders. When a fair price was obtainable for mutton, and when oats were cheap, he considered there was no better market for the cereals than feeding them to the sheep. A store sheep would fatten quickly on 1lb. of oats per day. From that contention he did not wish them to think that the animals should have nothing but oats and water. Much better results would be obtained if the sheep were allowed, at frequent intervals, the run of another pad-

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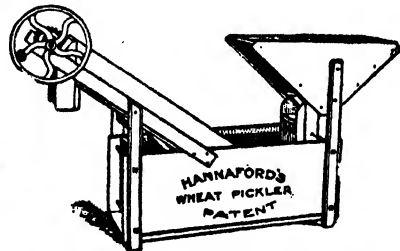
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dock, even if it did not contain very much natural pasture. Practically the same could be said with regard to the pea crop. In reply to a question regarding the hand feeding of sheep intended for market, Mr. Royal said he had offered 60 ewes for sale by auction, and refused 30s. 6d. per head. He fed them on 15 bags of oats, and then sold them four weeks later at 38s. 6d. per head. The market was considered on a par with previous sale. On that basis the oats would be worth 12s. per bushel.

#### ROCKWOOD.

June 20th.—Present: 19 members and three visitors.

POTATO GROWING.—“Potatoes are like all other vegetables, they need a good deal of attention to produce good results,” said Mr. A. Carter, in a paper on “Potato Growing.” The first point that required consideration was the selection of the seed. An application for the seed should be made early in the season, and an endeavor be made to secure unripe seed, so that heavy returns would be received. The five varieties—Redskins, Pinkeyes, Carmens, Snowflakes, and Bismarks—had all proved reliable croppers. The first three mentioned could be planted for a spring crop, while the Snowflakes and Bismarks were usually utilised for summer marketing. In the dry parts of their district he advised planting for the spring crop, say, from the end of July to the middle of August; while the summer crop could be planted about the end of November. If only a small patch was planted the work could be performed by hand; but for a large area a machine was the most economical. A very simple planter could be made by adopting the following plan:—Erect a tub or box on the plough, with a piece of down piping extending from the top of the tub to within a couple of inches of the bottom of the furrow. With one man driving the plough, and another dropping the seed down the tube, a large area can be sown in one day. If a spring crop was sown he advised ploughing the land at least 6in. deep and six weeks to two months before planting. After it had received further cultivation, 5cwt. to half a ton of bone super or potato manure should be drilled in to the acre. The plot could then be harrowed and rolled, and left until the time for planting. After the seed had been sown it was advisable to give the land a further harrowing and rolling. When the plants made an appearance another harrowing should be carried out, and the soil continually worked until the plants were from 6in. to 8in. high. The cultivator could then be worked, and the crop left until the plants flowered, before “hilling up.” The seed should be sown in rows 2ft. 6in. apart, with 1ft. 6in. between the sets. In the ensuing discussion, Mr. Steed questioned whether so much harrowing as that advocated by the speaker would make a payable crop. Mr. A. F. Henley did not think it advisable to harrow the crop after the plants were up. In reply to a question from Mr. Hodson as to why the plants should not be hilled before flowering, Mr. Carter said the deeper the potatoes were covered the less chance there was of grubs and worms getting into the tubers. He did not recommend the use of stable manure on heavy soils. If the seed was changed every year or two, the risk of having the crop attacked with Irish blight would be minimised. Mr. H. Dunn read a paper, “Compulsory Registration of Stallions,” and an interesting discussion followed.

#### URAILDA AND SUMMERTOWN (Average annual rainfall, 44.25in.).

July 7th.—Present: 10 members.

ECONOMIC IRRIGATION.—Irrigation is one of the most essential points in the success of gardening,” said Mr. E. Hart, in a paper under the above title. Continuing, the speaker said that without a good irrigation plant the profitable culture of vegetables and the raising of fodder crops could not be carried out to the best advantage. Kerosine, petrol, and oils, in addition to the wear and tear of the machine, made the engine a costly item for the gardener. To economise on irrigation, the speaker suggested the installation of a sufficient number of windmills to meet the requirements of the property. If necessary they could be used in conjunction with an engine, and also with the pipes laid down on the holding. After several years’ experience he had come to the conclusion that the windmill was a more economical means of raising water than the engine. When purchasing a mill one should secure the best machine possible, with nothing smaller than a 12ft. wheel. The machine should be self-oiling, with a tower at least 50ft. high.

# THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

## THIRTY-SECOND ANNUAL CONGRESS

TO BE HELD IN THE

VICTORIA HALL, GAWLER PLACE, ADELAIDE,  
ON SEPTEMBER 12th, 13th, and 14th, 1921.

CHAIRMAN—Mr. C. J. TUCKWELL (Chairman Advisory Board of Agriculture).

### DRAFT AGENDA.

#### MONDAY, SEPTEMBER 12—

##### OPENING SESSION, 8 p.m.

##### OPENING ADDRESS—

His Excellency the Governor, Sir W. E. G. A. WEIGALL, K.C.M.G.

Other Speakers—Minister of Agriculture (Hon. T. PASCOE, M.L.C.),  
Chairman (Mr. C. J. TUCKWELL).

#### TUESDAY SEPTEMBER, 13—

##### MORNING SESSION, 9.30 a.m. till 12 noon.

PAPER .. .. "Afforestation" .. .. Mr. P. J. CURNOW  
(Wirrabara)

ADDRESS .. "Oats" .. Mr. W. J. COLEBATCH, B.Sc. (Agric.), M.R.C.V.S.  
(Principal Roseworthy Agricultural College)

##### AFTERNOON SESSION, 2.15 p.m.

PAPER .. .. To be Selected

ADDRESS .. .. Mr. C. G. SAVAGE  
(Manager Government Experimental Orchard, Berri)

##### EVENING SESSION, 7.45 p.m.

ADDRESS .. "The Pig Industry: A  
Neglected Source of  
National Wealth" } Professor ARTHUR J. PERKINS  
(Director of Agriculture)

#### WEDNESDAY, SEPTEMBER 14—

##### MORNING SESSION, 9.30 a.m.

PAPER .. "How to make Country Life More Attractive,  
with a view to Increased Production" .. } Mr. H. DAVIS  
(Pinnaroo)

ADDRESS .. "Farm Sanitation" .. Lieut.-Col. W. RAMSAY SMITH  
M.D., D.Sc., F.R.S. (Edin.), (Head of the  
Department of Public Health, &c., &c.)

##### AFTERNOON SESSION, 2.15 p.m.

PAPER .. .. To be Selected

##### FREE PARLIAMENT.

##### EVENING SESSION, 7.45 p.m.

## FREE PARLIAMENT.

## RESOLUTIONS.

Branch.	Resolution.
1. (a) WIRRABARA . . . .	"That this Congress urges upon the Government the urgent necessity for introducing an up-to-date Apiaries Act, such Act to provide for, among other things, the registration of apiaries."
(b) WILLIAMSTOWN . . . .	"That this Congress recommends that the Government appoint an inspector of apiaries."
2. TAPLAN . . . . .	"That this Congress urges the Government to compel wheat merchants to supply farmers with carbon copies of the weights of individual bags of wheat delivered."
3. POMPOOTA . . . . .	"That the Government be urged to start an experimental farm on the reclaimed areas of the Murray, with the following provisos:—(a) The farm not to exceed 20 acres; (b) that the site be not selected from a choice portion of the swamp; (c) that a man with practical experience of reclaimed land be placed in charge; and (d) to experiment in treating the inferior classes of soils and fodder crops."
4. POMPOOTA . . . . .	"That this Congress urge upon the Government the necessity for breeding high class dairy stock, and assisting settlers to improve their dairy herds."
5. POMPOOTA . . . . .	"That this Congress urge upon the Government the necessity for opening up an export market for pigs, and giving every encouragement to the pig raising industry."
6. (a) PINNABOO . . . . .	"Veterinary surgeon for outlying districts."
(b) KOPPIO . . . . .	"Veterinary surgeon for Eyre Peninsula."
(c) MINNIPA . . . . .	"Veterinary surgeon for Eyre Peninsula."
7. LONE GUM . . . . .	"That a short course for the training of horticulturists be instituted at the Berri Experimental Orchard."
8. MINTARO . . . . .	"That this Congress recommends that the Winter School held at Roseworthy should be repeated during the year 1922."
9. MILTALIE . . . . .	"That in the opinion of this Congress, it is desirable that the present system of buying wheat on the f.a.q. basis be abolished, and a system of permanently fixed grades be substituted."
10. LONE GUM . . . . .	"That this Congress recommends that steps should be taken to endeavor to secure a removal of the prohibition of import of citrus fruits into America."
11. LONE GUM . . . . .	"That the Government be asked to secure a supply of cotton seed for distribution amongst branches of the Agricultural Bureau for experimental purposes."
12. KI KI . . . . .	"That this Congress recommends that the Government should strictly enforce the personal residence clause in leases."
13. RENMARK . . . . .	"That steps should be taken to preserve the timber growing on the bends of the River Murray."
14. RENMARK . . . . .	"That steps should be taken to secure Imperial preference for dried fruits."

## POINTS FOR PRODUCERS.

### **The Progress of Milk Recording in Great Britain.**

It may be remembered that the Milk Recording Scheme was inaugurated in the year of the war, and in the exceptional circumstances that prevailed, progress was necessarily slow, but during the year 1916-17, nearly 13,000 cows were recorded in England and Wales. In the following year the number was 20,000, a year later 38,000, and last year 60,000. This number will, undoubtedly, be increased very considerably during the present year. Certificates are issued by the Ministry for milk-recorded cows, giving not only the official milk yield of the cow, but also her summarised history for the period covered by the certificate. As much as £285 was paid last year for a non-pedigree cow with an official milk record certificate, and it is evidence of the farmer's recognition of the practical value of the new development that, while 640 certificates were applied for in 1916, the number applied for in 1920 was nearly 18,000. It is noted too that, of the cows certificated last year, 800 gave over 1,000galls., and two very exceptional animals 2,000galls. It will be remembered that grants are made by the Ministry to milk recording societies to meet up to half the expenses of the society. Grants are based on the number of herds in the society, and amount to £3 10s. per herd per annum for a new member, and £3 for a member who has been in the society over two years.

Nowadays the farmer knows what his cows are doing for him, and he sees to it that every cow earns her own living. The variation in the value of the milk produced per cow in different herds is very striking. For example, in taking some figures for the year 1919-20, it was seen that the average cow in the best herd gave £66 worth of milk, calculated at 1s. 6d. per gall. The average cow in the average herd yielded £47 worth of milk, and the average cow in the worst herd £37 worth of milk. In one country the milk recording society has increased its membership from 19 members with 20 herds in 1914, to 82 members with 69 herds in 1920. This society has joined the societies of neighboring counties in holding co-operative shows and sales, and, as the cows sold, have all had certified milk records, they have obtained far higher prices than would have been paid for them had such records been lacking. In spite of the fact that all the cows belonging to this society which were sold at these sales were non-pedigree, one fetched as much as £146 at the last sale, and the average was no less than £75. These figures are indeed a striking comment on the success of the milk-recording scheme.—Ministry of Agriculture and Fisheries.

### **The Movement towards Livestock Improvement in Great Britain.**

Although a policy of the closest economy has been imposed upon all Government Departments, and it has been found necessary to abandon many schemes of interest and value, the policy of improving the livestock of these islands still receives a measure of support, and for the



financial year now opening (1921-22) it has been found possible to allocate a sum of £35,000 for use in England and Wales says the Minister of Agriculture and Fisheries for Great Britain. Of this amount, £18,000 is set aside for grants for bulls, £7,800 for milk-recording societies, £7,250 for heavy horses, and £3,000 for boars. The provision covers grants for 900 bulls, 600 boars, 100 heavy horses, and for a few rams which will be used in North Wales, this last being a comparatively new experiment. The value of the grant is very considerable; it is both direct and indirect. For example, the livestock scheme can claim to have led to the formation of several new breed societies, with consequent improvement, both in the class of the animal and in the price paid for it. It is noticeable too that, during the period when the slaughter of calves was at its height, very few calves sired by subsidised bulls went for slaughter. It was clear that those who had bred a good calf were not disposed to see it turned to veal. The mere fact that it had good parentage was sufficient justification for an effort to rear it. Then again, there is a very brisk private market in premium sires, and although they may be bought in the first instance at quite a low figure, that figure tends to rise very considerably as soon as their worth is proved. For example, a boar bought for 20 guineas under the livestock improvement scheme, was sold some time later for 600 guineas, while a subsidised bull, sold for service in a pedigree herd, sired nine bull calves which averaged upwards of 500 guineas apiece. Figures of this kind have an eloquence that is irresistible. The heavy horse grants have been found to encourage co-operation among farmers for the hire of good class stallions, and those who knew how careless the farmer was in this regard only a few years ago, will admit the ample room for improvement. Quite apart from results that have in them something of a sensational element, livestock officers of the Ministry are able to record a state of general progress. For example, it is reported from one farm that the calves bred from a premium bull made £10 more per head than others born on the same farm from another sire. The possibility of securing good strains has led to the establishment of several new herds of Shorthorns in various parts of the country. In one instance, a bull bought under the livestock scheme for £240 was sold for 550 guineas to go abroad, while another that cost 43 guineas under the scheme ultimately reached the Argentine, where it fetched 550 guineas. The owner of one of the society's bulls won first prize at the Royal Norfolk Show, and has refused £250 for the animal. At the same time it is noticed that service fees are much higher than they were, and are paid without complaint for the use of registered sires.

#### **Imports and Exports of Fruits, Plants, &c.**

During the month of July, 1921, 10,509bush. of bananas, 202bush. of passion fruit, 4bush. of paw paws, 1,319bush. of pineapples, 1,309 bags onions, 26,221 bags of potatoes, 29 packages of bulbs, 60 packages of seeds, 130 packages of trees and plants, and 1,259 empty wine casks were examined and admitted at Adelaide and Port Adelaide under

the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910. Of these 150 bags of potatoes were returned to State of origin, 4bush. of paw paws (absence of fruit fly certificate) were destroyed, and 42 packages of trees and plants were fumigated.

Under the Federal Commerce Act:—2,257 packages of citrus fruit, 2,700 packages of preserved fruit, 17,198 packages of dried, 1 package of jam, and one package of honey, were exported to oversea markets. These were consigned as follows:—To London, 15,338 packages of dried fruit, 2,700 packages of preserved fruit, 12 packages of citrus fruit, and 1 package of honey. To New Zealand, 2,047 packages of citrus fruit, and 80 packages of dried fruit. To South Africa, 725 packages of dried fruit. To India and East, 5 packages of dried fruit, and 198 packages of citrus fruit. To U.S.A., 1,050 packages of dried fruit. To China, 1 package of jam.

Under the Federal Quarantine Act:—924 packages of seeds, &c., were examined and admitted from overseas sources.

## DEPARTMENTAL DOINGS.

### AGRICULTURE, ETC.

During the month of August, the Director of Agriculture (Prof. Arthur J. Perkins), visited the Experimental Farm at Veitch. He was accompanied by the Superintendent of Experimental Work (Mr. W. J. Spafford), who took the opportunity, whilst in the district, of addressing the Taplan Branch of the Agricultural Bureau. The Director also attended the Conferences of Southern and Pinnaroo Lines Branches of the Agricultural Bureau, held at Port Elliot and Parilla respectively.

### DAIRYING.

The Government Dairy Expert (Mr. P. H. Suter), visited Neeta, Murray Bridge, and Parilla. He addressed the Agricultural Bureau Branch at the first named, and the Conference of the Pinnaroo Lines Branches at the last.

The Assistant Dairy Expert (Mr. H. J. Apps), addressed the High School boys at Murray Bridge, and also conducted them through the local butter factory. This officer also lectured before the Mypolonga and Booborowie Branches of the Agricultural Bureau.

### GENERAL.

The Secretary Advisory Board (Mr. H. J. Finnis), visited and addressed Branches of the Agricultural Bureau at Windsor and Cherry Gardens. He also attended Conferences of Branches at Port Elliot and Parilla.

Mr. C. H. Beaumont (Horticultural Inspector, Southern District) addressed the Ashbourne Branch on "Preventing Waste of Fruit."

Mr. John B. Harris (Horticultural Inspector, Northern District) addressed the Dowlingville Branch of the Agricultural Bureau.

*(Continued on page 130.)*

## INQUIRY DEPARTMENT.

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Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"R. S. T.," Rockleigh, asks for dressing for sheep affected with maggots.

Reply—The following dressings are recommended:—(1) Any of the non-poisonous sheep dips in the proportion of 1pt. to 5galls. of water; (2) turpentine one part, castor oil three parts; (3) Stockholm tar 10 parts, castor oil three parts, kerosine three parts, turpentine half part (mix).

"A. S.," Cleve, reports draught gelding with a swelling on the ball of the eye about the size of a pea.

Reply—The swelling is called a staphyloma. It should not be interfered with unless the services of a qualified veterinary surgeon are available.

"J. C. G.," Bordertown, has (1) filly with swelling on both sides of wither, and (2) mare 10 years old, very fat. Red colored discharge from nostrils, and unable to eat or drink. Died after two days.

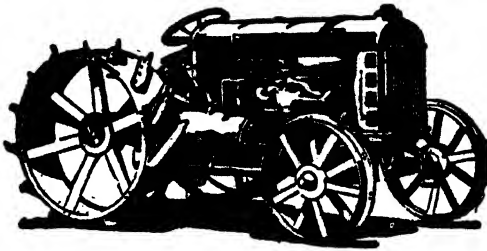
Replies—(1) The swelling on both sides of the withers containing pus is a fistulous wither. The treatment of this condition is surgical, and consists in thoroughly opening and draining the sinuses and cavities with a clean sharp knife. The channels formed by the pus can be explored with a clean knitting needle, and must be effectively drained. The wounds require to be dressed daily with disinfectant lotion, and all the sinuses washed out with the same fluid by means of a syringe, a household enema syringe being useful for this purpose. Use one part carbolic acid pure to 40 of water as a disinfectant solution (one tablespoonful to a pint). Daily dressings will be necessary for some weeks. (2) Death of mare with discharge from the nostrils. The mare had acute pharyngitis (sore throat). The immediate cause of death was probably swelling at the entrance of the windpipe (œdema of the glottis).

"C. G.," Inman Valley, reports (1) stiffness of the hindquarters in young boar and (2) filly with hard lump on point of shoulder.

Replies—(1) This symptom is common to several diseases. It may be due to injury or to some disease of the nervous system. Put him in a clean, dry, and comfortable sty. Supply light sloppy food, and give Epsom salts, 4oz., in the feed. (2) Apply a little red blister. Rub this in vigorously for five minutes. Tie her head up short for an hour after applying the blister. This should develop abscess formation. As soon as you can detect pus by the fluctuation of the swelling it should be evacuated. Make the incision so as to provide for the drainage of the cavity. Dress daily afterwards with disinfectant solution.

"A. C.," Narridy, has Berkshire sow with a tooth out, and subsequent swelling of the lower lip.

Reply—The probable cause of the trouble is an injury. Provide her with soft food for a few days. Give one dose of laxative medicine (Epsom salts 4oz.) in the feed.



## **FORDSON FARM TRACTOR**

There is no power farming job that the Fordson cannot do better, cheaper, and faster than it can be done by any other source of power.

Have your Fordson on the land to solve the spring ploughing questions. Meantime your Fordson will more than pay for your investment by handling every kind of draw, bar, and belt work, such as ploughing, threshing, pumping, baling hay, hauling wood, and supplying power for the farm lighting and other plant.

**Duncan Motors, Limited,**  
50, Franklin Street, Adelaide.

"J. R. C.," Longwood, has cow with a pea-like swelling at the base of the teat duct.

Reply—Thickenings of the canal of the teat in this situation do not respond to treatment. It would be advisable to let the quarter go dry. No external application is of any use.

"F. W. A.," Strathalbyn, reports cow with a small hole in the teat.

Reply—This is a milk fistula, and if small it will probably respond to an application of lunar caustic (silver nitrate). This is obtained in small pencil-like sticks. Put a point on the pencil and apply this carefully and thoroughly after moistening the edges of the opening. A large fistula would require more elaborate treatment. In this case the teat should be carefully cleansed with soap and warm water and dried. Insert a milk tube which has been boiled for a few minutes. Freshen up (scarify) the edges of the fistula with a small clean knife. Mop up all blood with clean wool or gauze, and paint the wound with tincture of iodine. Then apply a thin coat of Stockholm tar over the teat, and put on a light 2in. gauze bandage; put a coat of tar on each lap of the bandage until five or six layers have been applied, then sew the last turn, and put a coat of tar over all. The bandage must be applied with a little judgment, neither too tight nor too loose. After bandaging is complete remove the tube from the teat. Healing will take two or three weeks. Remove the bandage by first saturating with methylated spirits.

"G. Bros.," Brinkworth, have mare five years old, with lameness and subsequent swelling of the off fore leg.

Reply—The probable cause of the swelling is an injury leading to pus formation. It would be advisable to foment frequently with hot water. Make a small explanatory incision through the skin at the point where the hair has come off. If you locate pus here enlarge the skin wound sufficiently to evacuate the discharge and explore the region. It may be necessary to open the leg lower down to provide effective drainage for the pus. If you cannot detect pus formation at present continue the fomentations and look for and wait for further evidence of its presence (fluctuation, &c.). The doughy swelling of the brisket and belly is due to oedema, and should not be opened. Put her on soft food and green stuff. Discontinue aconite. Give Epsom salts one packet, saltpetre one teaspoonful daily in drinking water.

"W. D. McB.," Elliston, reports four year old filly with muscle that appears to have slipped off the shoulder.

Reply—Shoulder slip is a form of lameness common in young horses, and often resulting in long continued lameness. There is considerable wasting of the shoulder muscles. It may occur when young horses are put to work ploughing, especially where stumps are plentiful or where the horse is working in the furrow. She will require a long rest. The application of massage and liniment to the shoulder may be tried, or the part may be blistered with one to eight red iodide of mercury blister. Wasting of the shoulder muscles does not necessarily mean that this is the seat of lameness, as muscular atrophy (wasting) may accompany any chronic lameness, being due to disuse of the limb.

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## "CRUSADER" BENZINE

for your Farm Engines or Motor Cars.

**A. H. HASELL, Port Adelaide,**  
MANUFACTURER and IMPORTER.

## RANDOM AGRICULTURAL JOTTINGS.

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[By ARTHUR J. PERKINS, Director of Agriculture.]

Not infrequently we are appealed to as to the reason for abnormally bad germination in the wheat field: nor is it always easy to give satisfactory replies, mainly because of incomplete information supplied. At times it may be that the seed had "malted"; and this is not unusual, as a sequel to heavy February and March rains, and abnormally dry April and May, when moisture in the seed bed is sufficient to awaken life in the dormant grain, but too scanty and firmly held by the soil to provide for the immediate requirements of tender germinating rootlets. The damage is accentuated when these germinating rootlets cannot escape contact with strongly acid superphosphate, in which dry soil conditions have been powerless to bring about complete "reversion." It may be that the soil is insufficiently provided with basic material, the chief of which is lime, adequately to neutralise the corrosive acidity of the superphosphate, with disastrous consequences to germinating plants; but this is very unusual in South Australia. It may be again that the seed has been over pickled or not pickled in accordance with the rules of the art. But, apart from these more or less obvious cases, there are others that appear to defy satisfactory analysis because the information supplied is usually incomplete.

\* \* \* \* \*

A few weeks back a Yorke Peninsula farmer called at my office with samples of seed wheat, which, although sown under apparently favorable conditions, had given what was estimated to be no more than a 50 per cent. germination. The seed had been sown on fallow land shortly after a satisfactory fall of rain, at the rate of 66lbs. to the acre, with 1cwt. of superphosphate. It had been pickled with blue-stone in a Hannaford pickler, in strict accordance with printed instructions accompanying the machine, and which I have ascertained to involve a 1 per cent. solution of copper sulphate. The farmer wished to know why his seed had germinated so badly, and whether it was safe to use the balance on hand for resowing. In this case all the usual causes of faulty germination appeared to be eliminated; the seed had not been sown in land insufficiently moist to bring about immediate germination; it had not been over pickled; whilst lime deficiency in a Peninsula soil was highly improbable. In the circumstances it seemed probable that there was something amiss with the seed itself, and, unfortunately, an immediate reply could not be given.

The samples were handed to the Horticultural Instructor's Botanical Assistant to test their germinating powers, and eventually the following results were supplied to me:—

GERMINATION PERCENTAGE.	
King's Early .. . . .	58 %
Nugget .. . . .	47 %
Marshall's No. 3 .. . . .	25 %
Mean .. . . .	43 %
Control Check .. . . .	96 %

It will be noted that the average germination of the three samples was only 43 per cent. as against 96 per cent. for the control check, and that the farmer's estimate of a 50 per cent. field germination corresponded fairly closely with our results. What was wrong with the seed? Under the inspiration of a paper to which reference will be made lower down, I asked that the seed should be examined microscopically for mechanical injury, particularly in the neighborhood of the embryo or germ. The results of this examination were as follows:—

	Sound seed. %	Seed injured in neighborhood of germ. %	Weevil infested, broken seed, and impurities. %
King's Early .. . . .	25.0	65.1	9.9
Nugget .. . . .	35.6	54.6	9.9
Marshall's No. 3 .. . . .	37.2	54.2	8.6
Means .. . . .	32.6	58.0	9.5

It will be noted that if the seed sown corresponded to the samples supplied me, barely one-third consisted of sound grain, the balance consisting of grain injured over the embryo, weevil infected grain, broken grain and impurities. It cannot therefore be described as anything else than a very inferior sample of seed wheat.

On submitting the damaged grain to germination tests in comparison with the sound grain, the following results were secured:—

GERMINATION PERCENTAGES.		Grain injured in neighborhood of embryo.
	Sound grain.	
	%	%
King's Early . . . . .	72	43
Nugget . . . . .	56	17
Marshall's No 3 . . . . .	32	7
Mean . . . . .	53	22
Control check . . . . .	97	97

It will be noted again that the germination of the grain mechanically injured in the neighborhood of the embryo or germ, was very low. The low germination of apparently sound seed may be attributed to injury which escaped detection. We have here, therefore, a sample of grain which had been very much battered about in the course of harvesting operations; how injuries incurred in this fashion affect field germination is shown very clearly in a paper appearing in a recent number of the *Journal of Agriculture Research*.

The paper in question is by Annie May Hurd, and is entitled "Seed-Coat Injury and Viability of Seeds of Wheat and Barley as Factors in Susceptibility to Moulds and Fungicides." Among other



Plate I.—Thrashing Injury to Little Club Wheat.

A Seed coats uninjured.

B Seed coats broken.  $\times 12$ .

[From *Journal of Agricultural Research*, U.S.A.]



things, the writer's experiments clearly show that the loss of germinating power in seed wheat treated with copper sulphate or bluestone, whatever its strength, is attributable exclusively to the presence of mechanical injury to the neighborhood of the embryo, which brings the latter in immediate contact with the pickle. There is no doubt that this is not the first time that this fact has been demonstrated. It appears, nevertheless, to have been more or less overlooked or lost sight of within recent times. In this connection it is interesting to note that the writer's experiments show that hand threshed sound seed wheat can be immersed in a saturated solution of copper sulphate (about 1lb. of bluestone to 2½lbs. of water) for a period of six hours, and still show 100 per cent. germination. The loss of germinating power arising from mechanically injured seed-coat is shown by experiments with grain immersed in a bluestone solution, consisting of 1lb. of copper sulphate to 4 galls. of water (2½ per cent. solution), which may be summarised as follows:—

	Germination after immersion of 5 minutes.	1 hour.	6 hours.
	%	%	%
Seed-coats unbroken . . . . .	100	100	100
Seed-coats broken over endosperm. . . . .	100	92	68
Seed-coats broken over embryo . . . . .	58	0	0

It will be noted that sound seed shows no loss in germinating powers after six hours' immersion in a 2½ per cent. bluestone solution; that seed injured over the endosperm or starch bearing portion of the grain, suffers only slightly after one hour's immersion in the same solution; whilst seed injured over the embryo or germ, shows 42 per cent. loss after only five minutes' immersion. And we can now realise why the Yorke Peninsula farmer's seed germinated so very defectively. It should be added that lime-water treatment applied immediately after ordinary pickling serves to reduce somewhat the disastrous influence of bluestone on the germination of mechanically injured grain.

\* \* \* \* \*

Of interest, too, are Miss Hurd's experiments of mechanically injured, but unpickled grain. Here, again, mechanical injury to the seed-coat is shown to be a contributing factor in poor germination. Contrary, however, to what has been shown to be the case in the matter of bluestone injury, if the seed is unpickled, injury to the endosperm coat is dangerous, whereas surface injury to the embryo is comparatively innocuous so long as the latter retains its vitality. According to Miss Hurd, as soon as seeds with injured endosperm are brought into contact with sufficient moisture to induce germination, they are rapidly invaded by moulds, which live on the material intended for the seedling and eventually starve it to death. Moulds on the other hand, appear powerless to attack grain, the embryo of which alone is injured. Miss Hurd also found that pickling grain offered more or less effective protection against subsequent attacks of moulds.

\* \* \* \* \*

From what has been said it would appear to follow that each year we sow much seed in pure waste; whether in practice it can be avoided

is, of course, another matter. The only suggestion that can be made is, that where seed wheat is concerned, particularly careful harvesting methods should be resorted to. Whether the dead ripe heads of local harvest fields expose the grain to greater mechanical injury than the incompletely ripened heads of crops cut with a binder, and subsequently threshed, is perhaps a debatable question. Our dead ripe

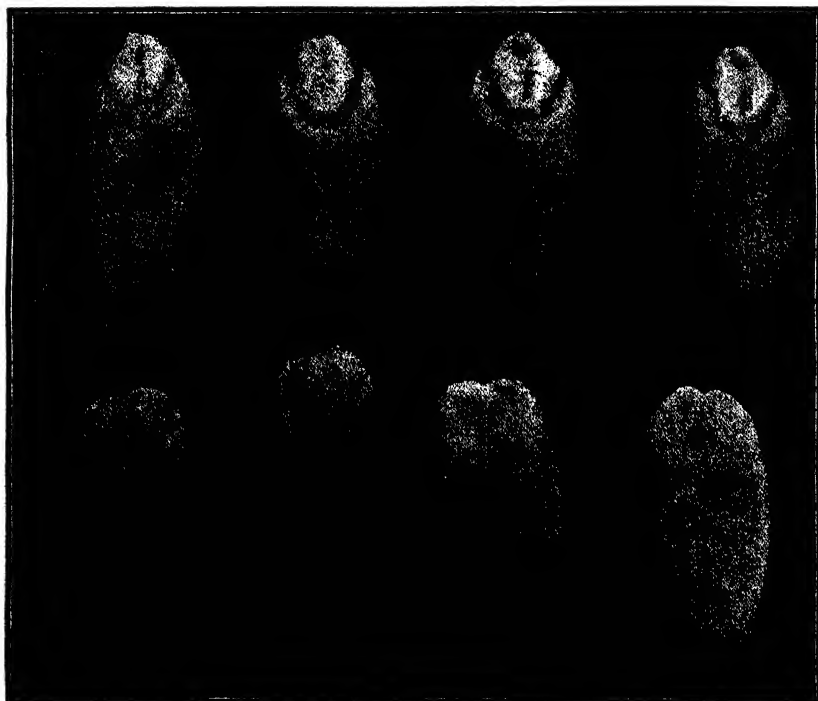


Plate II.—Samples of Commercial Early Baart Seed Wheat.

1. Unscoured samples, showing threshing injury. 2. Effect of scouring this wheat.  $\times 6$ .  
[From *Journal of Agricultural Research*, U.S.A.]

grain, threshed out under blazing suns is certainly drier, harder, more brittle, and as such exposed rather to breaking right out than to mechanical injury. It is possible, too, that the softer, less resistant, but tougher grain of damper countries is, as a rule, more subject to surface mechanical injury than is the case with us. On the other hand, let us not forget that even with us all these characteristic grain features are apt to reproduce themselves whenever we have to face abnormally wet harvesting weather. And this indeed was the case last season, which may serve to explain in some degree the misadventures of our Yorke Peninsula friend.

The illustrations accompanying these notes are taken from Miss Hurd's paper in the April, 1921, number of the *Journal of Agricultural Research*.

## EXPERIMENTAL FARM HARVEST REPORTS.

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### EYRE PENINSULA EXPERIMENTAL FARM.

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[By W. J. SPAFFORD, Superintendent Experimental Work, and  
R. HILL, Manager.]

This farm consists of 3,041 acres, comprised of the sections 26, 27, and 28, in the hundred of Minnipa, and situated 158 miles north of Port Lincoln, on the Port Lincoln to Cape Thevenard railway. It is fairly centrally situated as concerns the whole of Eyre's Peninsula, and is the point from which departmental activities in agricultural matters on that vast stretch of arable land will proceed. The most of the farm will be arable when the natural growth is removed, and consists of soils varying from light-colored, light-textured sands, growing broombush and porcupine, to heavy calcareous soils, with a tendency to run together and set hard; but the bulk of the block is between these two extremes, and consists of calcareous soils of medium texture, growing naturally mallees and large bushes. The above-mentioned sections were dedicated "a reserve for agricultural purposes" in November, 1914, and work was started and a manager appointed on January 1st, 1915.

#### THE SEASON 1920.

The total rainfall and its distribution this season at Minnipa proved very favorable for the growth of the cereals, and, as a consequence, good crops of these were the result. A little more than 1in. of rain fell in January, which led to the germination of many weeds on the fallowed land, and the killing of these practically ensured clean crops. The next three months proved comparatively dry, but from then onwards until December copious rains fell, and these were well distributed throughout the whole period. The total fall for the year reached 18.08in., of which 16.28in. fell during the growing season of the cereal crops. The following table sets out in

detail the rainfall recorded, together with that received at the farm since January, 1915:—

*Rainfall Distribution at Minnipa, 1915-1920.*

	1915.	1916.	1917.	1918.	1919.	1920.	Means. 1915-1920.
	In.	In.	In.	In.	In.	In.	In.
January . . . . .	0.74	0.80	2.02	0.46	0.50	1.02	0.92
February . . . . .	0.09	0.04	0.40	0.02	2.49	—	0.51
March . . . . .	0.02	0.44	0.94	0.46	0.02	0.42	0.38
April . . . . .	1.18	0.27	0.42	0.97	0.58	0.43	0.64
May . . . . .	2.03	1.23	2.84	1.14	0.66	2.14	1.67
June . . . . .	1.88	3.67	2.64	1.41	0.74	3.31	2.28
July . . . . .	2.54	3.60	3.08	0.77	0.70	2.15	2.14
August . . . . .	3.57	2.55	3.17	2.68	0.81	2.83	2.60
September . . . . .	0.98	2.33	2.81	0.05	1.32	1.97	1.58
October . . . . .	0.41	1.92	1.46	1.45	0.65	2.05	1.32
November . . . . .	—	1.05	1.58	—	0.11	1.40	0.69
December . . . . .	0.44	0.12	0.33	0.61	1.49	0.36	0.56
Totals . . . . .	13.88	18.02	21.69	10.02	10.07	18.08	15.29
Total "Useful" rain (April- November) . . . . .	12.59	16.62	18.00	8.47	5.57	16.28	12.92

It does not always follow that a high total rainfall between seeding and harvest leads to heavy grain yields, because on some occasions it is so badly distributed that the crops suffer rather than make good growth. In this particular season, as the next table shows, not only was the "useful" rainfall heavy, but its distribution was very favorable to the growth of the cereals:—

*Distribution of "Useful" Rainfall—Minnipa, 1915-1920.*

	1920.	Means. 1915-1920.
	In.	In.
Seeding rains (April-May) . . . . .	2.57	2.31
Winter rains (June-July) . . . . .	5.46	4.42
Spring rains (August-October) . . . . .	6.85	5.50
Early summer rains (November) . . . . .	1.40	0.69
Total "Useful" rain . . . . .	16.28	12.92

CROPS.

Of necessity, practically the only crops grown at this farm consist of the various cereals, and, other than these, only small areas are being tried.

*Hay Crops.*—As a lot of hay was required this season, about 47 acres in fields Nos. 6, 13A, and 13c were seeded with the intention of cutting the crops for hay, and, besides this area, a little more than 15 acres of crop were cut from headlands of grain crops. Field No. 6 carried wheat and barley crops in 1919, and was ploughed and cultivated between April 23rd and May 5th, and between May 5th and 6th, oats (mixed) were sown on portion of the field at the rate of 60lbs. seed with 1cwt. superphosphate per acre. Field No. 13A

was ploughed between July 24th and August 2nd, 1919, cultivated in early October, harrowed in the last week in December, again in January, and cultivated in the first week in May. Between May 7th and 11th, several solid-strawed hay wheats (King's Red and six beardless King's varieties) were seeded with 1cwt. superphosphate per acre, and the whole field was then harrowed. Field No. 13c was seeded on September 30th, 1919, with millets and Sudan grass, and, as these failed, the land was worked as bare fallow, ploughed between September 8th and 11th, rolled, cultivated, and rolled before the end of September, seeded with summer crops, harrowed on December 30th, cultivated in January, again in April, and was finally harrowed on April 17th. On April 14th, portion of the field was drilled in with Sunrise oats at the rate of 60lbs. seed with 1cwt. superphosphate per acre.

The yields of hay received from these various crops, together with the farm average for the year, are set out below:—

*Hay Yields—Minnipa, 1920.*

Kind.	Field Grown.	Area. Acres.	Total Yield.			Yield per Acre.		
			T.	C.	L.	T.	C.	L.
Oats (mixed) . . . . .	No. 6	8.67	25	16	0	2	19	58
Wheat (solid straw) . . . . .	No. 13A	31.64	90	17	58	2	17	50
Oats (Sunrise) . . . . .	No. 13C	7.03	18	6	56	2	12	15
Wheats (Headlands) . . . . .	No. 1	11.40	23	12	71	2	1	51
Wheats (Headlands) . . . . .	No. 5	3.25	5	14	61	1	15	27
Oats . . . . .	—	1.00	1	8	71	1	8	71
Farm average . . . . .	—	62.99	165	15	93	2	12	72

The farm average of over 2 tons 12cwt. of hay per acre is extremely good for these particular conditions, and is a long way ahead of the hay returns of any other season since this farm was started in 1915. The very even and regular distribution of the rainfall after seeding favored strong luxuriant growth with the satisfactory result shown above, and, although the grain yields were good, two previous seasons produced higher grain yields than did this one.

The next table gives details of all hay crops grown at this experimental farm since 1915, with the mean yield for the period:—

*Hay Returns—Minnipa, 1915-1920.*

Year.	Total "Useful"		Area. Acres.	Total Yield.			Yield per Acre.		
	Rainfall. In.	Rainfall. In.		T.	C.	L.	T.	C.	L.
1915 . . . . .	13.88	12.59	148.00	280	0	0	1	17	94
1916 . . . . .	18.02	16.62	2.34	4	0	0	1	14	19
1917 . . . . .	21.69	18.00	47.95	82	10	0	1	14	54
1918 . . . . .	10.02	8.47	30.60	28	0	0	0	18	34
1919 . . . . .	10.07	5.57	55.13	35	0	0	0	12	78
1920 . . . . .	18.08	16.28	62.99	165	15	93	2	12	72
Means . . . . .	15.29	12.92	—	—	—	—	1	11	77

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The hay crops grown in Field No. 13A were arranged as a comparative test between six "new" solid-straw wheats, and the proved hay wheat of the same type, King's Red. At the same time, a block of land was seeded with King's Red at the rate of 120lbs. of seed per acre as against 90lbs. per acre for all varieties under trial. Although King's Early wheat is generally recognised as a rather wonderful hay wheat in most districts in this State, giving very heavy yields of the most palatable of hays, it is not grown nearly as largely as would otherwise be the case, because it is bearded, and, although this objection is not founded on very strong grounds, it exists to such an extent that it was considered wise to endeavor to produce a beardless wheat possessed of the good qualities of King's Early. As a consequence, in 1913, several beardless half-bred King's Early wheats were crossed again with King's Early, and from the resulting crossbreds, the six wheats were selected after much work had been done with them as was shown in the Roseworthy Agricultural College Harvest Report for 1918-19 (*Journal of Agriculture*, 1919, pages 716, 717). The wheats chosen as being promising enough to eventually fulfil the ideal in view have the following breeding:—

*Rajah*.—King's Red x Anvil (King's White x Jonathan).

*Sultan*.—King's White x Caliph (Marshall's No. 3 x King's White).

*President*.—Anvil (King's White x Jonathan) x King's Red.

*Felix*.—Anvil (King's White x Jonathan) x King's White.

*Emperor*.—Beardless King (selection from King's Early) x King's Red.

*Mahrajah*.—King's Red x Anvil (King's White x Jonathan).

The returns secured from these varieties, as is shown in the next table, certainly demonstrate that the selection of the particular kinds was a wise one, and that the whole of them are worth persisting with, and further that, on present appearances, we are well on the road towards the replacing of King's Early by beardless wheats retaining the good hay qualities of this well-known sort:—

*"Solid-straw" Hay Wheats—Minnipa, 1920.*

Variety.	Seed per Acre.	Area. Acres.	Total Yield.			Yield Compared to per Acre. King's Early			90lbs. Seed.
			T.	C.	L.	T.	C.	L.	
King's Red . . . . .	90	20.45	59	17	92	2	18	64	100
King's Red . . . . .	120	1.88	4	18	75	2	12	54	90
Rajah . . . . .	90	0.96	3	0	53	3	2	111	108
Sultan . . . . .	90	1.84	5	5	106	2	17	65	98
President . . . . .	90	1.85	5	4	8	2	16	29	96
Felix . . . . .	90	1.87	5	2	100	2	15	3	94
Emperor . . . . .	90	0.96	2	10	106	2	13	8	91
Mahrajah . . . . .	90	1.83	4	16	78	2	12	94	90

*Oat Crops.*—The area sown to oats for grain was comparatively small, and the bulk of this area was utilised in No. 1 East, where nine varieties were tested on bare fallow.

Field No. 1 East was ploughed between August 4th and September 4th, cultivated in October, harrowed at the end of December and again in January, and rolled and cultivated by May 29th. Between May 11th and 14th, the oat varieties were drilled in at the rate of 60lbs. of seed with 1cwt. superphosphate per acre. Field No. 13c, as was pointed out in connection with the hay crops, was seeded to summer crops which failed, and the land was then worked up, and between April 14th and 15th, Algerian oats were sown on a portion of it at the rate of 60lbs. seed with 1cwt. superphosphate per acre.

The yields secured from the varieties of oats grown are shown in the next table with the farm average for the period:—

*Yields of Oat Varieties—Minnipa, 1920.*

Variety.	Field Grown. No.	Area. Acres.	Total Yield.		Yield per Acre.	
			B.	L.	B.	L.
Calcutta . . . . .	1 east	1.16	60	39	52	23
Algerian . . . . .	1 east	0.52	27	11	52	18
Clydesdale . . . . .	1 east	0.51	24	31	48	23
Cape . . . . .	1 east	0.92	44	12	48	6
Algerian . . . . .	1 east	4.75	225	21	47	19
Scotch Grey . . . . .	1 east	5.50	242	19	44	3
Algerian . . . . .	13C	3.74	158	27	42	17
Sunrise . . . . .	1 east	1.79	62	13	34	33
Goldfinder . . . . .	1 east	1.01	31	2	30	30
Algerian Tartar . . . . .	1 east	0.51	13	14	26	7
Ruakura . . . . .	1 east	0.51	13	1	25	22
Farm average . . . . .	—	20.92	903	30	43	8

The farm average of over 43bush. per acre for oats is certainly a very satisfactory one, and of the varieties grown, both Calcutta and Algerian, with over 52bush. per acre to their credit, show that these two kinds will give high yields at Minnipa, in good seasons at all events. This year's crop has brought the mean average yield for the farm since 1916 from a little over 29bush. per acre to over 32bush. per acre as is set out in the following table:—

*Oat Returns—Minnipa, 1916-1920.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.		Yield per Acre.	
	In.	In.		Bush.	lbs.	Bush.	lbs.
1916 . . . . .	18.02	16.62	49.90	1,987	20	39	33
1917 . . . . .	21.69	18.00	10.39	461	22	44	17
1918 . . . . .	10.02	8.47	21.03	568	12	27	1
1919 . . . . .	10.07	5.57	14.75	85	16	5	32
1920 . . . . .	18.08	16.28	20.92	903	30	43	8
Means . . . . .	15.58	12.99	—	—	—	32	2



The next table exhibited sets out in detail the behavior of the various varieties of oats tried at the farm since 1917, and, as these comparisons are continued, this particular table should become increasingly interesting as years go on, because the oat crop, on past performances, is likely to be an important one in this district.

*Oat Variety Yields—Minnipa, 1917-1920.*

Variety.	1917.		1918.		1919.		1920.		Means, 1918-20.	
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
Algerian . . . . .	37	5	25	12	18	29	45	27	29	36
Scotch Grey . . . . .	44	35	29	37	15	18	44	3	29	33
Sunrise . . . . .	—	—	27	2	9	6	34	33	23	27
Algerian Tartar . . . . .	—	—	20	0	10	7	26	7	18	31
Calcutta . . . . .	—	—	—	—	—	—	52	23	—	—
Clydesdale . . . . .	—	—	—	—	—	—	48	23	—	—
Cape . . . . .	—	—	—	—	—	—	48	6	—	—
Goldfinder . . . . .	—	—	—	—	—	—	30	30	—	—
Ruakura . . . . .	—	—	—	—	—	—	25	22	—	—
Farm average . . . . .	44	17	27	1	5	32	43	8	25	14
Rainfall . . . . .	21.69in.		10.02in.		10.07in.		18.08in.		12.72in.	

*Barley Crops.*—Five varieties of barley—Tunis 1, Tunis 5, Tunis 6, Roseworthy Oregon, and Shorthed—were seeded in June at the rate of 50lbs. seed with 1cwt. superphosphate per acre on wheat stubble in Field No. 6, and these crops were so luxuriant and rank, and they lodged to such an extent that the harvesting machines could not cope with them, the result being no grain yields for this crop this year. The next table shows the mean yield for the farm as if this season's crop was a total failure, but this is not strictly correct, for, although no grain was harvested into bags, the lodged crops were raked up and stacked for pig feed, and the amount of grain secured in this way was really considerable, but, unfortunately, no weights could be kept. The appearance of the crops at ripening time led us to expect from 35bush. to 50bush. per acre, but we were prevented from collecting it.

*Barley Returns—Minnipa, 1917-1920.*

Year.	Total Rainfall. In.	"Useful" Rainfall. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
1917 . . . . .	21.69	18.00	7.13	233 34	32 39
1918 . . . . .	10.02	8.47	11.85	261 39	22 5
1919 . . . . .	10.07	5.57	8.07	49 24	6 7
1920 . . . . .	18.08	16.28		Lodged too badly to harvest.	
Means . . . . .	14.96	12.08	—	—	15 13

*Rye Crops.*—Although all other cereal crops produced heavy grain yields, rye was again much below them, and finished up with only a

little over 5bush. of grain per acre. Only on one occasion, 1917, have we received a fair yield from this crop, as is set out below:—

*Rye Returns—Minnipa, 1917-1920.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.	Yield per Acre.
	In.	In.		Bush. lbs.	Bush. lbs.
1917 .. .. .	21.69	18.00	3.86	61 54	16 2
1918 .. .. .	10.02	8.47	2.72	21 36	7 56
1919 .. .. .	10.07	5.57	1.92	2 38	1 22
1920 .. .. .	18.08	16.28	2.02	10 34	5 14
Means .. ..	14.96	12.08	—	—	7 38

*Wheat Crops.*—Again, a very large assortment of varieties of wheats were grown this season at Minnipa, for, without such tests, it is almost impossible to correctly discover the types of wheat best suited to the conditions different from our proved wheat-growing districts. As, has been our practice in the past, most of the wheat crop was grown on fallowed land, but some was placed on "new" land, *i.e.*, freshly cleared land not fallowed, and some on stubble land.

The bare fallow sown with wheats was all in Field No. 1 (East and West), which was ploughed between August 4th and September 4th, cultivated between October 9th and 25th, harrowed at the end of December and again by January 22nd, rolled and cultivated in May, and between May 11th and June 5th was seeded at the rate of 60lbs. seed with 1ewt. superphosphate to the acre.

The "new" land that carried wheat was all in Field No. 5, and was ploughed between April 6th and June 16th, and immediately rolled (the roller working at the same time as the plough), then cultivated and harrowed, and the wheat varieties were seeded at the rate of 70lbs. of seed with 1ewt. superphosphate per acre between May 18th and June 21st.

The only piece of "stubble" land to be seeded to wheat was in Field No. 5, and was ploughed in April, and was rolled, cultivated, and harrowed before seeding.

The behavior of all varieties of wheats grown this year is to be seen in the following tables, together with the mean yields secured from (1) fallowed land, (2) "new" land, and (3) stubble land:—

*Wheat Variety Yields on Fallow—Minnipa, 1920.*

Variety.	Field Grown. No.	Area. Acres.	Total Yield.	Yield per Acre.
			B. L.	B. L.
Currawa .. .. .	1 west	0.46	16 28	35 48
Red Russian .. .. .	1 west	0.20	7 2	35 10
Baroota Wonder (sel. 2) ..	1 west	1.50	51 8	34 5
Queen Fan No. 2 .. .. .	1 west	0.08	2 43	33 57
Brown Caliph .. .. .	1 west	0.22	7 27	33 52

*Wheat Variety Yields—continued.*

Variety.	Field Grown. No.	Area. Acres.	Total Yield.		Yield per Acre.	
			B.	L.	B.	L.
Ensign . . . . .	1 west	0.41	13	39	33	18
Caliph No. 1 . . . . .	1 west	0.22	7	17	33	6
President . . . . .	1 east	2.56	84	10	32	53
College Eclipse . . . . .	1 west	0.56	18	25	32	53
Sultan . . . . .	1 east	3.05	99	32	32	38
Felix . . . . .	1 east	3.38	110	14	32	37
Carmichael's Eclipse . . . . .	1 west	0.42	13	40	32	32
Caliph No. 2 . . . . .	1 west	0.13	4	13	32	26
Queen Fan (sel. 2) . . . . .	1 west	0.38	12	19	32	25
Yandilla King (sel. 3) . . . . .	1 west	0.21	6	48	32	23
King's Red (sel. 3) . . . . .	1 west	0.23	7	26	32	19
Queen Fan No. 1 . . . . .	1 west	0.08	2	35	32	17
King's White . . . . .	1 west	19.58	632	9	32	17
Marshall's No. 3 (sel. 3) . . . . .	1 west	0.09	2	54	32	13
Marshall's No. 3 A1 . . . . .	1 west	0.08	2	34	32	5
Caliph (sel. 3) . . . . .	1 west	0.38	12	7	31	53
Gluyas (sel. 2) . . . . .	1 west	0.56	17	45	31	42
Baroota Wonder (sel. 3) . . . . .	1 west	0.25	7	55	31	40
Queen Fan (sel. 3) . . . . .	1 west	0.25	7	54	31	36
Walker's Wonder . . . . .	1 west	0.41	12	57	31	35
Canaan . . . . .	1 east	8.83	277	22	31	25
Leak's Rustproof . . . . .	1 east	2.08	64	45	31	8
Marshall's Early . . . . .	1 west	0.09	2	48	31	7
Flamen . . . . .	1 east	1.92	59	38	31	4
Marshall's No. 3 (sel. 2) . . . . .	1 west	1.64	50	39	30	53
Queen Fan (sel. 1) . . . . .	1 east	3.81	117	12	30	46
Emperor . . . . .	1 east	2.22	68	12	30	43
Red Eclipse . . . . .	1 west	0.44	13	31	30	43
Cad . . . . .	1 west	0.40	12	16	30	40
Gluyas (sel. 3) . . . . .	1 west	0.21	6	25	30	33
Basil . . . . .	1 west	0.39	11	53	30	28
Rajah . . . . .	1 east	1.33	40	10	30	12
Anvil . . . . .	1 east	0.77	23	11	30	6
Yandilla King . . . . .	1 west	1.80	54	1	30	1
Early Caliph . . . . .	1 west	0.21	6	18	30	0
Smutproof (sel. 2) . . . . .	1 west	0.11	3	17	29	51
Baroota Wonder No. 1 . . . . .	1 west	0.10	2	59	29	50
Mahrajah . . . . .	1 east	1.29	38	20	29	43
Onas . . . . .	1 east	1.94	57	37	29	42
Crossbred 53 . . . . .	1 west	0.13	3	51	29	37
Exquisite . . . . .	1 west	0.43	12	42	29	32
King's Red . . . . .	1 east	12.52	368	1	29	24
Marquis . . . . .	1 west	0.20	5	49	29	5
Bob's Red . . . . .	1 west	0.20	5	45	28	45
Alpha . . . . .	1 west	0.20	5	38	28	10
Ford . . . . .	1 east	0.76	20	56	27	33
Silver Baart . . . . .	1 west	0.20	5	30	27	30
Bobs . . . . .	1 west	0.20	5	22	26	50
Bonus . . . . .	1 west	0.39	10	26	26	45
Elation . . . . .	1 west	0.26	6	55	26	36
Late Gluyas . . . . .	1 east	4.84	127	7	26	16
J4 . . . . .	1 west	0.45	11	44	26	4
Fortune . . . . .	1 east	3.15	81	36	25	54
Cumberland . . . . .	1 west	0.43	11	7	25	51
Baroota Wonder No. 2 . . . . .	1 west	0.06	1	32	25	33
Sevens . . . . .	1 west	0.40	10	11	25	28
Lott's . . . . .	1 west	0.38	9	37	25	18
Forge . . . . .	1 west	0.38	9	36	25	16
Early Crossbred 53 . . . . .	1 west	0.38	9	20	24	34

*Wheat Variety Yields—continued.*

Variety.	Field Grown. No.	Area. Acres.	Total Yield.		Yield per Acre.	
			B.	L.	B.	L.
Cadet . . . . .	1 west	0.41	10	0	24	23
Glencoe . . . . .	1 west	0.45	10	48	24	0
Huguenot . . . . .	1 west	0.42	8	49	21	0
Fane . . . . .	1 east	2.97	62	14	20	57
Newman's Early . . . . .	1 west	0.44	8	56	20	18
College Comeback . . . . .	1 west	0.41	7	32	18	22
Average for fallow . . . . .	—	96.33	2,902	59	30	8

*Wheat Variety Yields on "New" Land—Minnipa, 1920.*

Variety.	Area. Acres.	Total Yield.		Yield per Acre.	
		Bush.	lbs.	Bush.	lbs.
Federation . . . . .	9.07	265	53	29	19
Smutproof . . . . .	2.43	67	45	27	53
Queen Fan . . . . .	1.77	48	51	27	25
Gluyas (sel. 1) . . . . .	6.10	161	19	26	27
King's White . . . . .	7.96	291	57	25	22
Gluyas . . . . .	18.78	445	55	23	45
Caliph . . . . .	13.55	277	52	20	30
Caliph (sel. 2) . . . . .	1.66	32	53	19	49
King's Red (sel. 2) . . . . .	1.42	21	54	15	25
Caliph (sel. 1) . . . . .	1.19	15	13	12	47
Smutproof (sel. 1) . . . . .	0.54	3	42	6	51
Gluyas (exp.) . . . . .	6.19	165	5	26	40
Queen Fan (exp.) . . . . .	8.39	180	53	21	34
Caliph (exp.) . . . . .	7.53	70	22	9	21
Average for "new" land . . . . .	86.58	1,959	14	22	38

*Wheat Yield on Stubble Land—Minnipa, 1920.*

Variety.	Area. Acres.	Total Yield.		Yield per Acre.	
		Bush.	lbs.	Bush.	lbs.
Wheat (mixed) . . . . .	13.60	177	55	13	5

The yields produced by many of these varieties of wheats are really good, and the average yield of all kinds grown on bare fallow, being more than 30bush. per acre, is most pleasing, and clearly shows that in seasons of good rainfall, heavy grain yields can be expected from well worked fallow land in the Minnipa district. The highest yield secured, almost 36bush. per acre, was from Currawa, a Victorian wheat which is yielding consistently well in most of our mallee districts when the rainfall is not particularly low. Red Russian is favorably known and largely grown in nearly all of our low-rainfall districts, and would be even more popular if it was less liable to be affected by "bunt." Baroota Wonder has not yielded particularly well at Minnipa, but is a good grain producer in many of our mallee districts, and has the advantage that it is a really good hay wheat. The other varieties which gave more than 33bush. per acre—Queen Fan, Caliph, and Ensign—all originated at Roseworthy Agricultural College

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I give it to all ages, including calves. Of all the excellent things you make, you have nothing to beat your Karswood Cow Drinks. You can make any use you like of this letter.

THOMAS DAVIES."

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The next table summarises the wheat crops grown this year, and gives the farm average for the season:—

*Farm Wheat Average—Minnipa, 1920.*

Where grown.	Area.	Total Yield.		Yield
	Acres.	Bush.	lbs.	per Acre. Bush. lbs.
Fallowed land . . . . .	96.33	2,902	59	30 8
"New" land . . . . .	86.58	1,959	14	22 38
Stubble land . . . . .	13.60	177	55	13 5
Farm average . . . . .	196.51	5,040	8	25 39

It would have been very surprising if the yield of wheat from fallowed land had not exceeded those from "new" land and stubble land, and the difference between the first two is about what would be expected. "New" land again produced more wheat per acre than did stubble land, and it certainly appears to confirm the findings of 1919 crops, *i.e.*, that if high returns are to be secured, "new" land should be compacted with rollers immediately after ploughing. The farm average of 25bush. 39lbs. per acre is very satisfactory, and, although not the highest since the commencement of the farm in 1915, a larger total amount of wheat was harvested than in any other year.

The farm averages for each year since 1916 are set out below, with the mean yield for the period:—

*Wheat Returns—Minnipa, 1916-1920.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.	Yield per Acre.
	In.	In.		Bush. lbs.	Bush. lbs.
1916 . . . . .	18.02	16.62	171.73	4,908 6	28 35
1917 . . . . .	21.69	18.00	76.65	1,999 34	26 5
1918 . . . . .	10.02	8.47	141.37	3,022 55	21 23
1919 . . . . .	10.07	5.57	112.52	980 40	8 43
1920 . . . . .	18.08	16.28	196.51	5,040 8	25 39
Means . . . . .	15.58	12.99	—	—	22 5

The five-year average yield of 22bush. 5lbs. per acre is really good, and demonstrates fully that when proper methods are practised, these particular conditions are certainly well suited to the wheat crop. It is all the more satisfactory, because the crops were produced from (1) fallow, (2) "new" land, and (3) stubble land, and during the period the average annual rainfall has only been 15.58in.

In the next table the wheat crops grown on the farm have been separated according to the soil condition in which they were grown, but owing to the fact that no fallow land was available in 1917, the mean yields are only taken for the three seasons, 1918 to 1920.

*Wheat Yields from Various Soil Treatments—Minnipa, 1916-1920.*

Year.	Total Rainfall. Ins.	"Useful" Rainfall. Ins.	Fallowd land. Bush. lbs.	"New" land. Bush. lbs.	Stubble land. Bush. lbs.	Farm average. Bush. lbs.
1916 . .	18.02	16.62	34 55	24 41	27 17	28 35
1917 . .	21.69	18.00	—	26 18	25 42	26 5
1918 . .	10.02	8.47	23 44	14 12	18 14	21 23
1919 . .	10.07	5.57	9 36	9 21	3 11	8 43
1920 . .	18.08	16.28	30 8	22 38	13 5	25 39
Means,						
1918-1920	12.72	10.11	21 9	15 24	11 30	18 35

As a very large assortment of varieties of wheats have been grown in each of the past three seasons at this farm, their behavior has been set out in the next table, together with a few others that have been introduced more recently:—

*Yields of Wheat Varieties on Fallow—Minnipa, 1918-1920.*

Variety.	1918.	1919.	1920.	Means, 1918-1920.
Felix . . . . .	25 29	15 22	32 37	24 29
Sultan . . . . .	24 17	15 26	32 38	24 7
Red Russian . . . . .	25 48	10 48	35 10	23 55
President . . . . .	23 57	14 0	32 53	23 37
College Eclipse . . . . .	25 19	11 7	32 53	23 6
Canaan . . . . .	23 21	14 14	31 25	23 0
Gluyas . . . . .	24 32	11 29	31 23	22 28
Rajah . . . . .	24 31	12 37	30 12	22 27
Walker's Wonder . . . . .	23 42	11 43	31 35	22 20
Carmichael's Eclipse . . . . .	25 20	9 8	32 32	22 20
Emperor . . . . .	23 20	12 54	30 43	22 19
King's White . . . . .	27 27	7 4	32 17	22 16
Caliph . . . . .	21 33	11 55	32 21	21 56
Mahraja . . . . .	23 7	12 25	29 43	21 45
Ensign . . . . .	23 32	7 47	33 18	21 32
Late Gluyas . . . . .	25 2	13 9	26 16	21 29
King's Red . . . . .	24 16	10 8	29 27	21 17
Flamen . . . . .	25 10	6 51	31 4	21 2
Leak's Rust Proof . . . . .	23 0	8 55	31 8	21 1
Smptproof . . . . .	24 42	8 10	29 51	20 54
Silver Baart . . . . .	25 57	8 57	27 30	20 48
Exquisite . . . . .	21 19	10 49	29 32	20 33
Federation . . . . .	21 49	10 25	29 19	20 31
Onas . . . . .	23 36	7 42	29 42	20 20

*Yields of Wheat Varieties—continued.*

Variety.	1918.	1919	1920.	Means, 1918-1920.
Marshall's No. 3 . . . . .	20 45	9 5	31 0	20 17
Fortune . . . . .	27 5	7 33	25 54	20 11
Anvil . . . . .	23 8	6 46	30 6	20 0
Baroota Wonder . . . . .	17 29	8 30	33 17	19 45
Yandilla King . . . . .	20 49	7 47	30 15	19 37
Cad . . . . .	21 36	6 32	30 40	19 33
Ford . . . . .	25 1	5 50	27 33	19 28
Lott's . . . . .	24 4	8 18	25 18	19 13
Cumberland . . . . .	23 45	6 50	25 51	18 49
Bonus . . . . .	21 7	7 1	26 45	18 18
Marquis . . . . .	17 9	7 43	29 5	17 59
Queen Fan . . . . .	15 24	7 14	31 2	17 53
Basil . . . . .	16 58	6 2	30 28	17 49
Fane . . . . .	24 14	7 45	20 57	17 39
Newman's Early . . . . .	23 29	8 20	20 18	17 22
Crossbred 53 . . . . .	15 54	6 23	29 37	17 18
Cadet . . . . .	21 42	5 6	24 23	17 4
Early Crossbred 53 . . . . .	20 22	6 14	24 34	17 3
Sevens . . . . .	19 38	5 40	25 28	16 55
Forge . . . . .	14 25	7 4	25 16	15 35
College Comeback . . . . .	20 18	7 2	18 22	15 14
Huguenot . . . . .	18 50	4 57	21 0	14 56
Red Eclipse . . . . .	—	9 52	30 43	—
J4 . . . . .	—	11 20	26 4	—
Bobs Red . . . . .	—	7 52	28 45	—
Glencope . . . . .	—	12 32	24 0	—
Elation . . . . .	—	9 34	26 36	—
Bobs . . . . .	—	7 52	26 50	—
Currawa . . . . .	—	—	35 48	—
Brown Caliph . . . . .	—	—	33 52	—
Marshall's Early . . . . .	—	—	31 7	—
Early Caliph . . . . .	—	—	30 0	—
Alpha . . . . .	—	—	28 10	—
Farm average . . . . .	21 23	8 43	25 39	18 35
Rainfall . . . . .	10.02in.	10.07in.	18.08in.	12.72in.

The outstanding feature of this table is the fact that every variety which has yielded very well throughout this period, belongs to the generally recognised class of "early, hardy wheats," and their behavior certainly points out that, in these particular conditions, the bulk of the area cropped with wheat should be seeded with varieties belonging to this class, and that only a limited amount of the "later" varieties should be sown.

## EXPERIMENTAL PLOTS.

The plots on "new" land, testing various quantities of seed per acre, were again conducted with Caliph wheat, using the same amounts of seed as in previous years, and the results secured are tabulated next.



# *Rate of Seeding Tests with Wheat on "New" Land—Minnipa, 1920.*

Seed per Acre.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
30lbs. Caliph .. . . .	1.29	8 41	6 44
40lbs. Caliph .. . . .	1.28	10 3	7 51
50lbs. Caliph .. . . .	1.23	13 8	10 41
60lbs. Caliph .. . . .	1.27	11 20	8 55
75lbs. Caliph .. . . .	1.22	14 8	11 35
90lbs. Caliph .. . . .	1.24	13 2	10 31

# *Rates of Seeding Tests with Wheat on "New" Land—Minnipa, 1918-1920.*

Year.	Yield Per Acre.						Farm Average "New Land".	Rainfall. In.
	30lbs. Seed.	40lbs. Seed.	50lbs. Seed.	60lbs. Seed.	75lbs. Seed.	90lbs. Seed.		
	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	
1918 .. .	16 26	17 34	15 52	17 22	14 17	17 43	14 12	10.02
1919 .. .	10 10	9 41	10 26	11 53	13 31	12 9	9 21	10.07
1920 .. .	6 44	7 51	10 41	8 55	11 35	10 31	22 38	18.08
Means ..	11 7	11 42	12 20	12 43	13 8	13 28	15 24	12.72

For some unexplained reason the yields secured this year were extremely low, and, at the same time, were very erratic, but, even with these figures included for the period 1918-1920, the results show that it is necessary to use at least 50lbs. of seed per acre on "new" land in the Minnipa district if anywhere near the full profits are to be obtained.

Quantitative manurial tests were commenced in 1916 and have been continued on the same lines ever since, so that we now have the results from five crops. Queen Fan wheat was again used at the rate of 60lbs. seed per acre on all plots. Details of these plots are arranged in the next two tables:—

# *Manurial Tests with Wheat on "New" Land—Minnipa, 1920.*

Manuring per Acre.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
No manure .. . . .	1.70	33 20	19 36
$\frac{1}{2}$ wt. superphosphate .. . . .	1.70	37 14	21 54
1wt. superphosphate .. . . .	1.69	35 20	20 54
2cwts. superphosphate .. . . .	1.63	34 40	21 16
3cwts. superphosphate .. . . .	1.67	40 19	24 9

# *Manurial Tests with Wheat on "New" Land—Minnipa, 1916-1920.*

Year.	No Manure.	$\frac{1}{2}$ wt. Super.	1wt. Super.	2cwts. Super.	3cwts. Super.	Farm Average. "New" Land.	Rain- fall.
	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	In.
1916 .. .	19 56	22 55	24 11	28 35	—	24 41	18.02
1917 .. .	15 35	26 48	29 39	31 17	31 9	26 18	21.69
1918 .. .	8 6	10 47	9 53	10 38	13 46	14 12	10.02
1919 .. .	2 44	6 12	7 47	10 7	9 57	9 21	10.07
1920 .. .	19 36	21 54	20 54	21 16	24 9	22 38	18.08
Means, 1917-1920	11 30	16 25	17 3	18 19	19 45	18 7	14.96

Unfortunately, in the first year of these experiments, no provision was made for a plot receiving a dressing of 3cwt. of superphosphate per acre, and so the mean yields are only shown for the past four seasons, so that a correct comparison can be made. The results so far secured clearly show:—

1. That wheat without manure on "new" land produced 11bush. 30lbs. per acre.
2. That the addition of  $\frac{1}{2}$ cwt. superphosphate increased the yield by 4bush. 55lbs. per acre.
3. That by the use of 1cwt. superphosphate the yield was brought to 17bush. 3lbs. per acre.
4. That a dressing of 2cwt. superphosphate further increased the yield to 18bush. 19lbs. per acre.
5. That 3cwt. superphosphate per acre still increased the yield of grain and produced 19bush. 45lbs. per acre.

Beside the above experiments, a series of cultivation tests on "new" land were conducted, in which blocks of land ploughed at the one time were treated in different ways before seeding. In these plots, Gluyas wheat was seeded at the rate of 65lbs. of seed with 1cwt. superphosphate on all plots. The returns secured are set out below:—

*Cultivation Tests on "New" Land—Minnipa, 1920.*

Land ploughed April, 1920, then before seeding:—	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Harrowed . . . . .	1.64	46 20	28 15
Rolled . . . . .	1.58	41 9	26 3
Rolled twice and cultivated . . . . .	1.50	38 26	25 37
Rolled twice and cultivated twice . . . . .	1.47	39 10	26 39

## FARMERS' CO-OPERATIVE EXECUTORS AND TRUSTEES, LIMITED.

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## WINTER SCHOOL FOR FARMERS.

[HELD AT ROSEWORTHY COLLEGE.]

The opening of the Winter School for Farmers at the Roseworthy Agricultural College by His Excellency the Governor (Sir Archibald Weigall, K.C.M.G.) last month marked a new era in the history of an institution which has always stood for agricultural education and progress.

The Honorable the Minister for Agriculture (Hon. T. Pascoe, M.L.C.), who was accompanied by the Premier (Hon. H. N. Barwell, M.P.), presided and expressed great pleasure at being responsible for the inauguration of a system whereby the farmers were brought closely in contact with the officers of his department, and the many useful activities in operation at the Roseworthy Agricultural College.

His Excellency congratulated the Government on the forward movement in the direction of providing further educational facilities for the man on the land, and referred to the presence of the Premier (Hon. H. N. Barwell, M.P.) as indicating the recognition of the paramount importance of technical knowledge in respect of agriculture in a State like South Australia, the prosperity and progress of which depended almost wholly on rural production. He felt confident that good must result from the establishment of farmers' classes, and added, that if other duties had not precluded him from doing so, he would have been delighted to share with them the many and absorbing interests and discussions that he knew would be crowded into the ensuing fortnight.

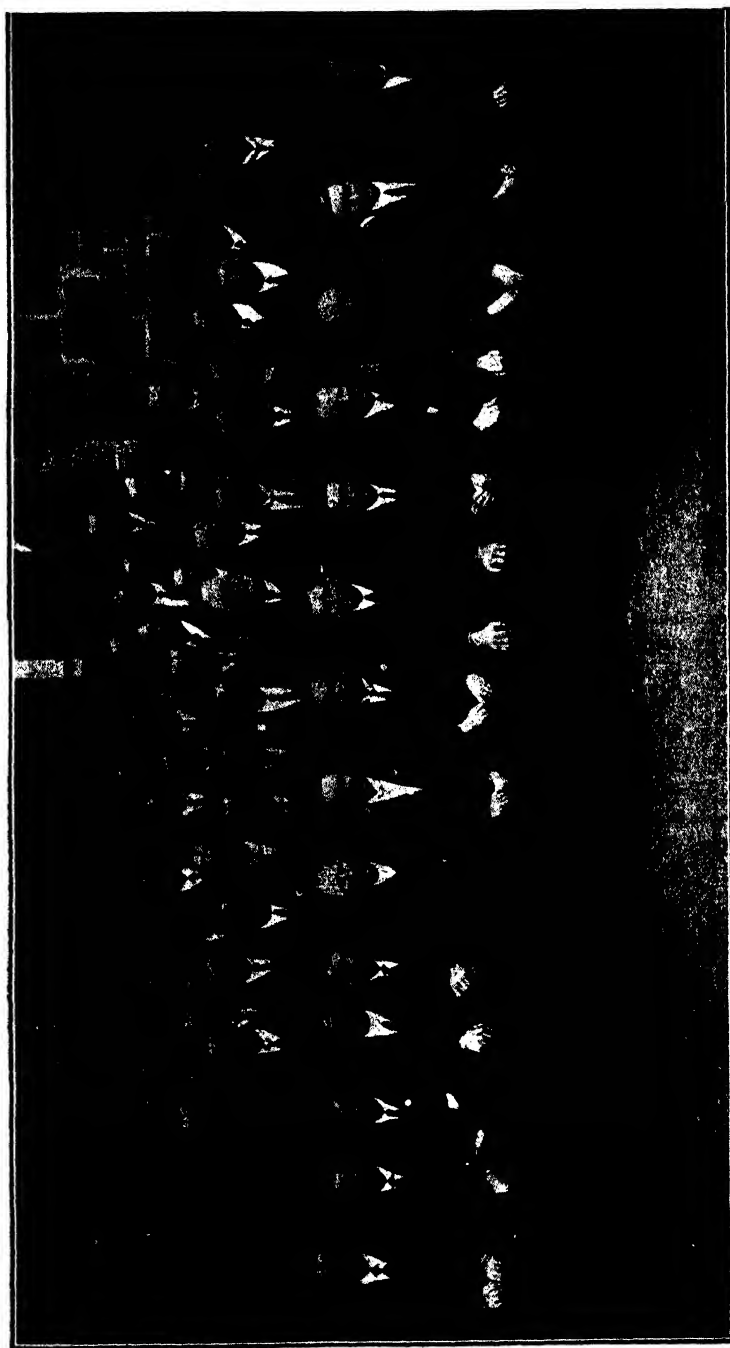
The Honorable the Premier thanked His Excellency for his presence and the stimulating nature of his remarks when declaring the Winter School open. He cited the formation of the Winter School as but one instance of the determination of the Government to assist the farming community, and spoke in appreciative terms of the support given by Branches of the Bureau to the offer extended to them.

As this is the first occasion upon which a gathering of farmers has been organised for a continuous series of lectures and demonstrations at Roseworthy College, it will be of interest to record the history of the movement.

In 1909, the late Mr. E. H. Coombe, when Commissioner of Crown Lands, interested himself in the matter, and authorised the formation of farmers' classes at the College, but as only eight applications were received, the scheme had to be abandoned.

In August of last year, Mr. W. S. Kelly urged the Advisory Board of Agriculture to recommend the inauguration of a Summer School for Farmers, to be held at a seaside resort in the vicinity of Adelaide.

A committee consisting of Professor Perkins (Director of Agriculture), Mr. W. J. Colebatch, B.Sc., M.R.C.V.S. (Principal of Roseworthy Agriculture College), and Mr. W. S. Kelly (Vice-Chairman of



Winter School for Farmers held at the Roseworthy Agricultural College, July, 1921.

the Advisory Board of Agriculture), was appointed to formulate a scheme, and they reported in favor of a Winter School of a fortnight's duration being conducted at the Roseworthy Agricultural College under the direction of the Principal, the staffs of the Department of Agriculture, and the College to co-operate in making the syllabus as attractive and interesting as possible.

The Advisory Board adopted this scheme, and on its recommendation the Minister of Agriculture (Hon. T. Pascoe, M.L.C.) approved of it being carried out on the lines suggested. At the instance of Mr. W. S. Kelly, he further agreed to allow members of Agricultural Bureau preference in the event of the number of applications being greater than the College could accommodate. The Secretary of the Advisory Board (Mr. H. J. Finnis) circularised all Branches of the Bureau throughout the State, and Mr. Kelly personally visited a large number of districts and emphasised the value of the proposed School to those engaged in agricultural pursuits. It was largely due to the activities of these two gentlemen that the idea "caught on" in the country districts, and it soon became apparent that the College would be filled to overflowing. The maximum number of beds available being fifty two, the first nominees of the Branches up to that number were accepted, and notice was given that no further applications could be considered. Notwithstanding this public announcement, no less than sixty-six branches applied, and several requests for enrolment were also received from non-members of any Agricultural Bureau. Owing to the lateness of the season, some of the original nominees could not attend, but substitutes were arranged in every instance where notice of inability to come was given. Unfortunately, a few who accepted failed to come, and omitted to acquaint the Principal with their change of plans, and consequently were, inadvertently no doubt, the means of preventing others who could have been present, from enjoying the advantages offered. There were thirty-nine branches represented, and as two were admitted at the last moment from one branch, the number on the roll was forty.

A comprehensive programme of studies was arranged by the Principal, and the departmental staff entered enthusiastically into the project, as also did the College lecturers. The members of the school were keenly enthusiastic, and maintained their interest throughout the course. A fine spirit of good fellowship pervaded the whole body, and, whilst future schools may assume larger proportions, it may be confidently stated that a more successful one could hardly be conceived of.

At the conclusion of the course the members of the school entertained the Principal and staff at a complimentary social, and presented a framed photograph of the school to Roseworthy College in token of appreciation.

They also expressed their gratitude to the Hon. Minister for Agriculture in the following terms:—"We, the undersigned, on behalf of the Farmers' Winter School just having completed its course, wish

to extend to your department our appreciation of the opportunity afforded them by the institution of such a school. We feel that the course has been very interesting and of considerable educational value. In addition to its advantages to each individual student, it is a means of spreading the principles of scientific agriculture throughout the State. We are sure that this will be very beneficial to the industry of agriculture, and express our desire that the school may be continued annually in the interests of this important industry."

The syllabus of classes was as follows:—

Monday, July 18th.—Opening addresses; wool-classing, Mr. A. H. Codrington; principles of breeding, Mr. W. J. Colebatch.

Tuesday, July 19th.—Soils, Mr. R. C. Scott; budding and grafting, Mr. D. G. Quinn; points of the horse, Mr. F. E. Place; principles of breeding, Mr. W. J. Colebatch.

Wednesday, July 20th.—Management of dairy cattle, Mr. R. Baker; diseases of crops, Mr. W. J. Spafford; grain grading and pickling, Mr. R. C. Scott; diseases and parasites of poultry, Mr. D. F. Laurie.

Thursday, July 21st.—Establishment and management of orchards, Mr. D. G. Quinn; building construction, Mr. J. Paull; milk testing and herd testing, Mr. R. Baker; parturition, Mr. F. E. Place.

Friday, July 22nd.—Farm bookkeeping, Mr. H. C. Pritchard; feeding of cattle, Mr. R. Baker; pruning, Mr. D. G. Quinn; dairying, Mr. P. H. Suter.

Saturday, July 23rd.—Field class, Mr. W. J. Colebatch.

Monday, July 25th.—Manures and manuring, Mr. W. J. Spafford; varieties of cereals, Mr. A. J. Adams; parasites of farm animals, Mr. F. E. Place.

Tuesday, July 26th.—Seed selection and plant breeding, Mr. R. C. Scott; tractor demonstration; butter making, Mr. R. Baker; fat lambs, Mr. W. J. Colebatch.

Wednesday, July 27th.—Silos and silage, Mr. R. Baker; chemistry of soils, fertilisers and waters, Mr. E. G. Stephens; horseshoeing, Mr. F. E. Place; pig breeding and feeding, Mr. H. J. Apps.

Thursday, July 28th.—Examination of horses for soundness, Mr. F. E. Place; sheep demonstration, Mr. W. J. Colebatch; pig killing and bacon curing, Mr. R. Baker; forage crops, Mr. W. J. Spafford.

Friday, July 29th.—Diseases of fruit trees and vines, Mr. D. G. Quinn; poultry farming, Mr. D. F. Laurie; farm implements and machines, Mr. H. R. Nourse; common diseases of livestock, Mr. F. E. Place.

Saturday, July 30th.—College experiments, Mr. W. J. Colebatch.

#### AGRICULTURAL BUREAU BRANCHES REPRESENTED AT THE FIRST WINTER SCHOOL FOR FARMERS, JULY, 1921.

Arthurton, K. L. Roads; Brinkley, E. G. Humphrey; Bundaleer, E. S. Cooper; Clare, J. Butler, T. G. Victorsen; Clarendon, D. R. Spencer; Cherry Gardens, A. R. Stone; Coomandook, W. Ninnis; Gawler River, T. M. Rice; Geranium, F. Hughes; Glencoe, L. V. Cram; Hartley, D. W. L. Freestun; Keith, A. M. Densley; Koppio, M. T. Gardner; Kybybolite, S. Shepherd; Lameroo, A. J. A. Koch;

Laura, P. T. Bowker; Lucindale, P. W. Dow; Mantung, H. E. Solly; Maitland, W. R. G. Bayly; Miltalie, W. G. Smith; Moorook, A. G. Carne; Morehard, R. B. Gregory; Mount Barker, W. O. Smith; Mintaro, R. M. Kelly; Moorak, C. C. Collins; Mount Gambier, H. A. Major; Naracoorte, J. M. Wray; Nantawarra, A. R. Herbert; Netherton, A. W. G. Bald; Pinnaroo, M. S. Davis; Redhill, A. B. Leaney; Riverton, R. A. Kelly; Stockport, R. Whitelaw; Strathalbyn, E. B. Saunders; Wirrabara, H. H. Jericho; Wynarka, A. W. Rackham; Yacka, J. S. Tilbrook; Yadnarie, A. G. Kruger; Younghusband, D. R. Brinkley; 40 nominees, 39 Branches.

## ORCHARD NOTES FOR THE SOUTHERN DISTRICTS.

[By C. H. BEAUMONT, Orchard Inspector.]

September and October are very busy months for the orchardist. Pruning will have been completed, and cuttings removed or burned. Ploughing should be pushed on, away from the trees if the soil has been before turned towards the trees.

Hoe around trees where implements cannot reach. If it is intended to apply manure to the trees, it is now a good time to do so. Spread the manure within 3ft. to 4ft. of the butt. The quantity will vary with the age of the tree. Bonedust, from 3lbs. to 4lbs. for small trees, to 8lb. to 10lbs. for large trees, will be the best at present available. Stable manure is good. Lime is good if sorrell is growing near the trees; use 10lbs. to 20lbs. to each tree.

It is time to plant all citrus trees. Be sure that they are free from disease and weeds, trim any broken roots or branches, and plant in the ordinary way. If dry weather follows, see that the young trees are watered in good time.

Spraying for fungus pests must be carried out as the buds swell, just as they are at bursting point is the exact time, but a little before or after makes no material difference. Be sure to use fresh lime and good bluestone; mix often and use soon after mixing and good results are certain. The method of mixing "Bordeaux mixture" has been described at length before, but a descriptive pamphlet may be obtained on application to the Department of Agriculture.

Woolly aphis may require some attention: pure kerosine, applied with a paint brush, will do good work on isolated spots.

Strawberry mildew will be checked satisfactorily by the use of "Lime sulphur solution" sold ready for use, 1½galls. in 100galls. of water is strong enough. Flowers of sulphur dusted on to the plants is effective in warm weather. Examine all fruit in cool stores, especially large fruits. Watch for cutworms about young plants and vines. Spray with arsenate of lead. It is time to attend to any grafting which may be required.

If planting tomatoes, use only known robust varieties, and shelter them as much as possible. It seems that many of the later varieties are too delicate to withstand our changeable climate.

## DOWNY MILDEW.

[By Professor T. G. B. OSBORN, D.Sc., Consulting Botanist and Plant Pathologist to the Department.]

The disease of grape vines called "downy mildew" has been known in Europe for more than 40 years as a most serious vine trouble, but it did not appear in Australia till the season 1916-1917. Now, after three seasons, it has made its first appearance in South Australia. The trouble showed itself late in the season, and only as a very slight attack; but this, unfortunately, is no guide to what its development may be in the coming season. While there is no need for alarm on the part of growers, all who are in any way interested in the grape industry should be aware of the danger, and prepared to combat the pest. At the outset it should be remembered that, while no cure for downy mildew is known, prevention by spraying at suitable times is comparatively easy and certain.

Downy mildew usually attacks the leaves, but the young canes, flower bunches, and part-grown berries may also be affected, sometimes severely. In the latter cases the crop may be a total loss, while a severe, or epidemic, attack on the leaves may result in defoliation. In the latter case, the berries harvested are so very poor in sugar as to be almost valueless. Juice reading 8deg., and even 6deg. Baume', has been recorded.

### EXTERNAL APPEARANCES.

The first indication of the fungus is usually seen on the leaves. Indefinite spots appear, which are irregular in size and shape, and which, from the upper side, look yellowish. If such a leaf be held to the light, such spots appear more transparent than the rest of the leaf. For this reason, and from their color, they are sometimes termed "oil spots," for they suggest that in these areas the leaf has been touched by a drop of oil. This unhealthy appearance is due to the presence of the fungus in the tissues of the leaf, though at this stage it is invisible externally. Within a few days of the appearance of the spots the fungus becomes apparent externally, forming the so-called "down" on the *underside* of the leaf. This "down" resembles rather patches of some crystalline substance like fine sugar, and is due to the development of great numbers of upright branching fungus threads bearing spores at the end of their branches.

The amount of "down" that is developed depends entirely upon the weather at the moment. If it be moderately warm, 60deg. to 75deg. F., and moist, "down" will be developed in great quantity and large, glistening, white blotches appear. In dry air little or no "down" is formed, the spot becomes yellow or red, and finally brown, as the leaf area that has been killed by the fungus dries up.

It was in this latter form, *i.e.*, as small spots, that downy mildew was present in South Australia this autumn. It was often difficult to find a leaf that showed "down" in places where the fungus was clearly present, to judge from the spots on the leaves. These spots



were usually brown and angular, being bounded by the veins of the leaf, often running into the angle between two main veins. Any fungus growth visible was usually to be found at the margins by these veins. After a little experience, such spots are easily recognised as distinct from the many other dead or discolored areas that may be found on a leaf, due to various causes, for they are very characteristic (Fig. 1).

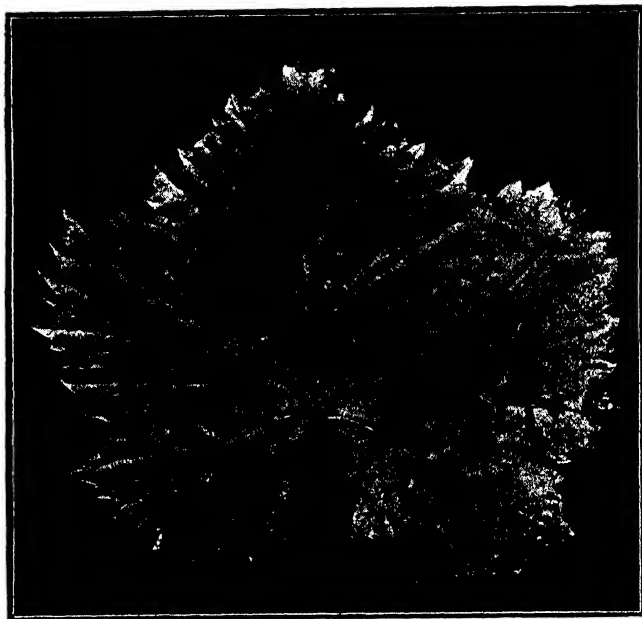


Fig. 1.—Leaf of vine (Grenache) showing the small angular brown spots that are produced as a result of a slight attack of downy mildew. Specimen collected at Watervale, May 19th, 1921.

If the combination of temperature and atmospheric humidity is suitable, the spots will be large and densely covered with fungus spores on the underside of the leaf. The appearance of such leaves is seen in Fig. 2. Leaves that are as seriously affected as this soon dry up and fall off, so that if the disease, has assumed epidemic proportions, the vines may be defoliated.

In some cases an epidemic of downy mildew developing early in the season has shown a special partiality for the flower bunches and just-formed berries, completely destroying these, and leaving the leaves only slightly affected. Again, the berries may be attacked when about two-thirds grown, and the majority of them destroyed. Usually, however, downy mildew may be expected to show itself upon the leaves.

#### THE FUNGUS.

The downy mildew fungus, known as *Plasmopara viticola*, is a relative of Irish blight of potatoes. Like Irish blight, it does great damage in a few days, under favorable conditions; but, also like Irish

blight, it may be expected to do little harm in South Australia in most seasons. Generally speaking, the weather in this State is too hot and dry for its successful development; but in the exceptional season it may be expected to do as much harm here as elsewhere. The experience of vigneronns at Mildura and the Murrumbidgee areas has shown that only too clearly. It is not a pest that can be neglected.

The fungus grows and feeds within the tissues of the leaf or part attacked. It only comes to the surface to form its reproductive spores. These are developed in great numbers at the end of upright branching fungus threads, about one-fiftieth of an inch in height. The spores are minute and exceedingly light; and, when ripe, they fall away from their stalks and float in the air. To judge from the spread of the fungus in Australia, as a result of the outbreak at Rutherglen, in 1916-1917, they must be carried by the wind for very great distances.

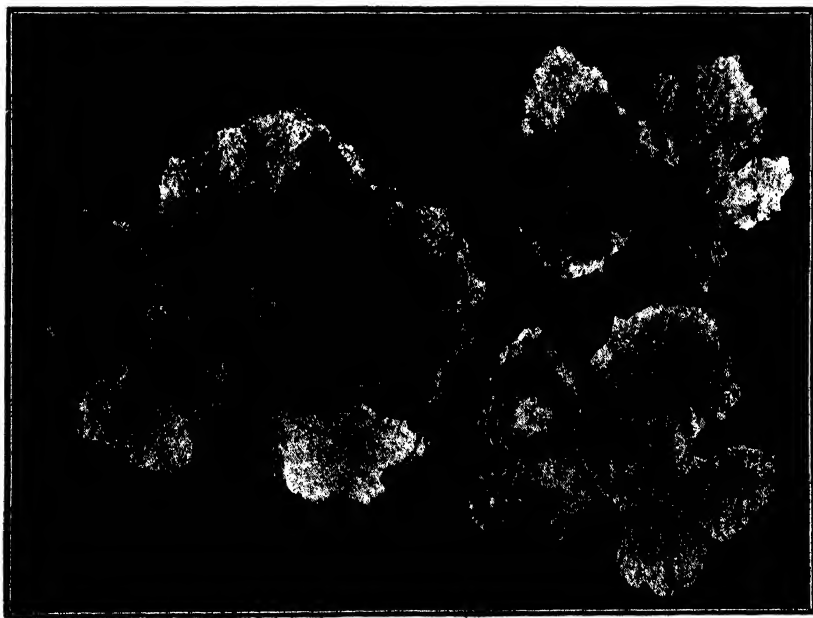


Fig. 2.—Leaves of vine showing the irregular white patches formed on the undersurface, owing to the presence of downy mildew fungus in quantity. Specimens from herbarium material kindly sent by Mr. C. C. Brittlebank, from Wahgunyah, Victoria, February 2nd, 1917.

These air-borne spores are only able to germinate in water. There the contents divide up into six to eight portions, each of which escapes on the opening of the spore as a very minute swimming body. After swimming for about 15min., the spore settles down and puts out a tube, which grows in through one of the stomates or breathing pores of the leaf, thus entering the living tissues. This constitutes infection.

The fungus develops inside the leaf, but its presence is not usually apparent until about seven days after infection, after which time the yellowish spots described above become visible. From these in a day or two a new crop of spores develops in moist air. If it be dry, these are not formed, and at the end of a few more days, during which the fungus is latent within the leaf and will grow out under wet conditions, the area of diseased tissue dies, producing perhaps only a few spores at the margins.

The period of time occupied in germination depends on the temperature. It is usually about  $1\frac{1}{2}$  hours, but is more rapid in warmer weather. Forty minutes only has been recorded at a temperature of 77deg. F. Following this, there is the period of some 15min. during which the little spores are swimming, followed by a further period in which the germ-tube is growing through a breathing pore of the leaf. From first to last, the whole period from germination to infection may be only about  $1\frac{1}{2}$  hours, at most it is likely to be two or three times as long. It is only during this period that the fungus is vulnerable. Within the leaf no poison can reach it without killing the vine. But before it has entered, it requires only a trace of a solution of copper to do so. The deduction is obvious: *Spray*, as far as possible, *before the first infections*.

By successive crops of spores the fungus carries on during the growing season. Once it is established in a district it is improbable that it is ever entirely absent, though its presence may not be obvious, or even impossible to demonstrate. Under ordinary conditions of dryness in South Australia the fungus will probably only be present in small amount. The life of one of the air-borne spores is relatively short. It must fall into water to germinate within a few days after being shed or it loses its vitality. It is, moreover, susceptible to heat, so that a spell of hot weather, with a day or two over 100deg. F., may be expected to check the spread of downy mildew very considerably. Nursery stock, because it is low growing and more closely planted, is more likely to show the fungus at such times than the growing vines. But because the fungus may be present to only a very small extent, that is no guarantee that, under favorable conditions, it will not become epidemic. Nothing is so remarkable about downy mildew as the rapidity of its spread when the moist, warm weather favors its development.

A second type of spore is developed, especially towards the end of the growing season, and carries the fungus over the winter. These spores are formed as a result of a sexual process, in which an egg-like body within the leaf tissues is fertilised; hence they are known as oospores, or eggspores. The oospore is a resting spore. It does not germinate till after a period of some months, and then only when certain conditions as to temperature and excess of moisture are fulfilled. These spores are found in the dead and shrivelled parts of the leaves, and, with them, fall to the ground. In this manner the soil becomes infected. It is at once obvious that unless all dead leaves are collected and destroyed, there is no means of killing these spores. This is clearly impracticable. The resting spore walls are tough and thick, so that they are not affected by drying; they are very resistant

to ordinary spells of heat and cold, and are found to pass uninjured through the gut of farm animals. It is because downy mildew overwinters on the ground in the form of these spores, and not upon the canes, that no winter treatment of the fungus is practicable. In this respect it is quite unlike anthracnose or black spot.

The resting spores germinate in the following spring only in the presence of water. It has been shown that the spore must be submerged during the period of germination, which at 52deg. F., has been found to be 24 hours. After this time the thick wall ruptures, and a single large spore is developed at the end of a short stalk. The contents divide up into 18 to 20 minute swimming bodies. These, if conveyed to a wet leaf, infect it by way of the breathing pores, as before. In this manner the new season's outbreak is started.

#### TREATMENT.

From the foregoing three fundamentals of treatment become clear.

1. Once the fungus has entered the leaf, the disease cannot be cured, for the attack is proceeding within the leaf tissues.

2. No winter treatment of the disease is of value, for the fungus is in the soil.

3. Preventive measures in the form of spraying are sure and effective, for the spores are easily killed on germination before the leaf is infected.

Only experience under South Australian conditions can show when spraying can be most effectively employed, but that of other States can be taken as a guide. The first spraying should aim at so covering the young leaves and shoots with a solution of copper that the first spores are killed when they reach the leaf. It is easy to see that this spraying may be applied too late; but it is equally possible to spray too early. In this case, the growth of the vine subsequent to the application will be unprotected.

The experience of the Victorian experts, Messrs. de Castella and Brittlebank, is that October 15th to October 20th is about the right time. If the spring opens late, the application may be correspondingly later. At this time the new shoots should be 12in. to 18in. long, with the young flower bunches exposed. These are, as has been seen, liable to attack, and should be well covered by the first spraying.

How often it will be necessary to spray afterwards will depend on the season. In Europe, in a bad season, it may be needful to do so every fortnight. In South Australia such continued wet weather as is implied by this would be unknown. Probably two or three applications during the season will be sufficient, because hot, dry weather may be expected, which will effectively prevent spore formation, and kill the fungus within the leaf.

All authorities urge that once it has become necessary to spray, *the process must be done quickly*; the fungus develops and spreads under suitable conditions with great rapidity. It is for this reason that the special forms of tractor spraying machines have been invented.

The sprays to use are either Bordeaux or Burgundy mixtures. It is interesting to remember that the former spray was discovered by Millardet in connection with the treatment of downy mildew when it first appeared in Europe.

The objection to Bordeaux mixture in South Australia appears to lie in the difficulty of getting pure fresh burnt lime. When this cannot be relied upon it is better to use the copper soda mixture. The formulae for the sprays that have been recommended are as follows:—

Bordeaux mixture—6lbs. of copper sulphate, 4lbs. of fresh burnt lime, and 40galls. of water.

Burgundy mixture—4lbs. of copper sulphate, 6lbs. of washing soda, and 40galls. of water.

Directions for making the spray solutions have been repeatedly given; they are set out at length in Bulletin 42 of the Department of Agriculture. Essential points to remember are that the bluestone and soda are dissolved separately in known quantities of water (say 1gall. to the pound), the bluestone in a wooden vessel; the solutions are then diluted to the proper strength, *i.e.*, in this case each made up to 20galls.; if lime is used it must be carefully slaked, and the creamy or milky liquid then diluted; the two solutions are mixed by adding the lime or soda to the copper solution, or *vice versa*, or by pouring equal volumes of the dilute solutions into a third vessel, and stirring well; the mixture is then made up to the proper strength. It is advisable to strain the lime solution to remove gritty particles. In using any spray remember the object is to create as fine a mist as possible so that all surfaces of the plant may be covered evenly by the solution. In combating downy mildew, where infection occurs by means of the breathing pores, which are on the underside of the leaf, this is very important.

#### POINTS TO REMEMBER.

An attack of downy mildew cannot be cured, but it can be prevented. Once the fungus has entered the leaf it cannot be killed, but it can be killed before it enters by a spray.

The glistening white growth of the fungus is limited to the *lower surface* of the leaves. Even when small in amount, it is *dense*; so quite unlike powdery mildew or oidium disease.

The fungus can only infect the leaf when it is wet with water; infection, therefore, takes place during or immediately after rain.

It is little use to spray directly after rain. If downy mildew is about, infection will have occurred. Spray about a week later, and the spray will then be ready to kill the new crop of spores when they germinate.

The spray solutions to use are Burgundy or Bordeaux. Most authorities prefer the latter, but if fresh burnt lime cannot be obtained, it is better to use the copper soda solution.

Spraying must be done quickly. For that reason tractor sprayers have been recommended, rather than knapsack machines (except for small areas) or motor pumps.

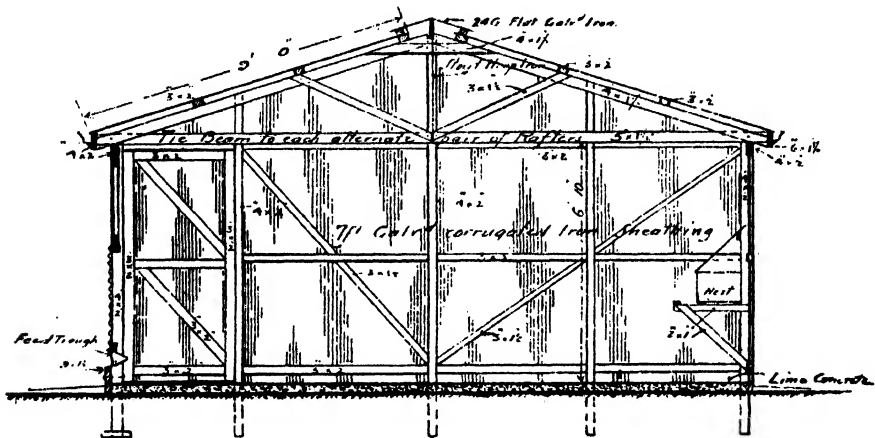
In case of doubt, suspected leaves, &c., should be sent immediately to the Department of Agriculture for determination. Enclose specimens in a tin and pack with slightly damp newspaper or rag wrapped around them.

## SPECIFICATION FOR THE MATERIAL AND ERECTION OF LARGE POULTRY HOUSE.

[By D. F. LAURIE, Poultry Expert.]

When autumn and winter eggs are expected, and when ease of handling large flocks is in view, then this type of house stands alone.

**Material.**—The gable-roof type is preferable for hot climates, and, as the structure is of considerable dimensions and may be subjected to considerable wind pressure, it is advisable to select sound material, and of the dimensions shown.



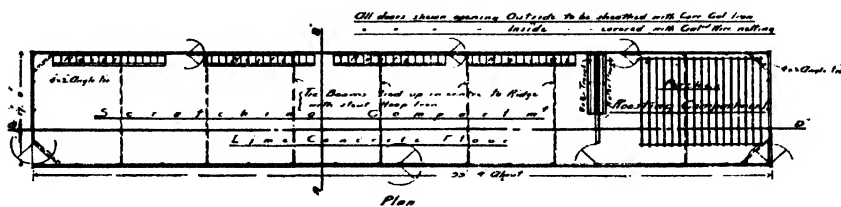
*Section of Gable-roofed House.*

**Timber.**—The posts and any other timber in contact with the ground should be redgum or jarrah, or any other timber which is white-ant resistant. Stringybark and oregon should be avoided for the purpose. Rails, rafters, purlins, &c., may be of oregon or any other suitable strong wood. The covering (or sheathing) shown is galvanized iron, 26 gauge, and is to be recommended.

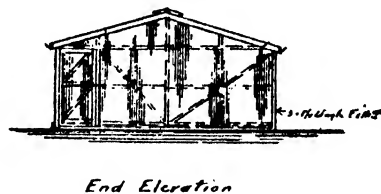
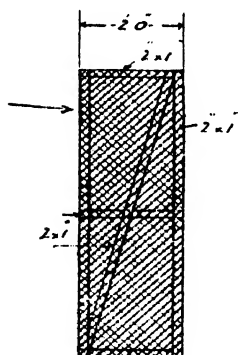
**Site of House.**—The position chosen for the house should be well drained. If necessary, a site must be prepared at least 6in. above the surrounding ground. The material used for the purpose must be levelled and well rolled so as to form a solid foundation for the concrete floor of the house.

**Aspect.**—The house should face north or a little east of north. In this State the cold winds and much of the rain come from a southern or north-western quarter. Houses facing north receive the maximum amount of sunshine, especially in winter—this is desirable. The plans appear to be sufficient to enable anyone to erect a poultry house to either type, *i.e.*, the gable-roofed or the lean-to type.

It will be seen from the plan of the building that the roosting compartment is at one end—the west end—of the building, and is separated from the scratching compartment by a division and door. This division is made by two sheets of galvanized iron erected horizontally.



Above that is wire-netting. The galvanized iron portion of the division is thus about 14ft., the other 3ft. being taken up by the door. The object of the division is to enable one to confine the birds in the roosting compartment at night. It will be noted that the water service is in duplicate—connected—one set in the roosting compartment, the other in the scratching compartment.



Door covered with  
Galv. Wire netting

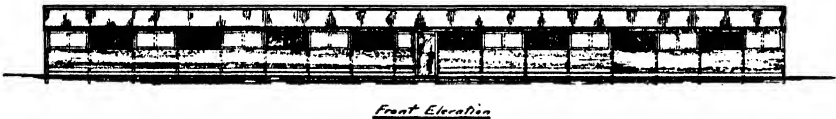
**Doors.**—All external doors are framed as shown, and sheathed with galvanized iron. Inner doors, as shown in detail, are of wire-netting, and are placed inside the outer doors. These serve for use on hot days, &c. The outer door is opened and air currents pass through the wire-netting. This is a most convenient arrangement.

**Ventilation.**—In the lean-to type of house, ventilators are provided in the back wall; they are 10ft. long and 1ft. deep, spaced 10ft. apart, allowing one in the roosting house. These ventilators are fitted with a "spreader" as shown, 10ft. long, formed by one 10ft. sheet of iron. The object is to deflect the incoming air current, causing it to strike the roof and so percolate through the house without causing a draught. The houses are fitted with weather screens in front. In rough weather striking the front of the house, these screens are closed, the back ventilators can then supply the necessary ventilation.

In the gable-roofed type of house, the back ventilators are not provided; air comes in at the wall-plate, passes up under the roof and out at the ridge. It will be noted that the ridge capping is made of 24 gauge flat iron, and is set up on small blocks above the purlins so as to secure good ventilation. The roofing iron does not extend to the ridge board, for the same reason. Front of house is built to the same design as in "lean-to type," only to the dimensions shown.



*Draughts* are to be most carefully avoided. More losses are caused through draughts than is generally recognised. Draughts cause colds and general ill-health, and most certainly lower the egg yield. Therefore, all walls should be free of open spaces, chinks, or crevices.



*Front of House.*—The various plans show the construction clearly. By using two sheets of corrugated iron fixed horizontally, a wind screen about 4ft. deep is formed. This is attached top and bottom to 3in. x 2in. rails. Under the bottom rail, and resting on a 9in. x 1½in. jarrah board, the food troughs are fixed. Above the wind screen of galvanized iron, hinged shutters are shown. There are various methods, any one of which may be selected.

The whole opening above the permanent wind screen is closed with wire-netting. The methods are as follows:—

(a) The roosting compartment and, say, 40ft. of the scratching shed may be provided with shutters.

(b) Glass may be used to close in each alternate space of 10ft. The intervening spaces may be fitted with shutters sheathed with galvanized iron or with oiled calico.

(c) As in (b), but using "Spondite" or any of the new "glass substitutes."

(d) Calico (oiled), or bagging (hessian) curtains on rollers full length of the house.

*Food Troughs.*—These are made of 26 gauge flat galvanized iron, and three sets can be cut from a sheet 72in. x 36in. They are so pivoted that they can swing in or out. Before feeding, they are tipped so that the attendant goes along the front of the house, fills the trough with mash (or green food), and then tips them back. Grain is not fed in these troughs.

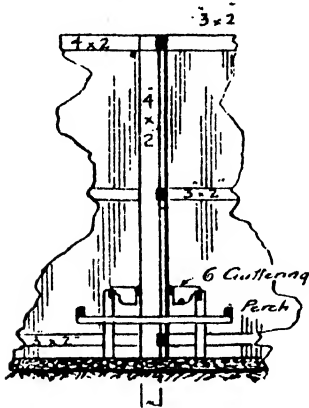
The house has a concrete floor on which are a few inches of sand and plenty of scratching material (straw, &c.), in which the grain



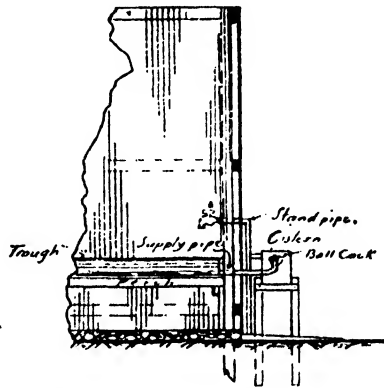
is always fed. The floor is put in after the house is built. The old litter should be cleared out once in two months, and twice a year the floor should be swept clean and hosed down, and then treated with a watering-can of good disinfectant. This keeps the house in a sanitary condition.

*Nests.*—For light breeds, these are fixed on a light frame as shown. Kerosine or petrol tins serve admirably. A slanting cover is fixed above them to prevent the hens from roosting there when the roosting compartment door is open. For heavy breeds, the nest should be larger, and on the ground.

Clean dry sand, say, 2in., is much better than straw. The hens cannot scratch it out of the nests and the eggs are kept clean, and vermin is less likely to breed.

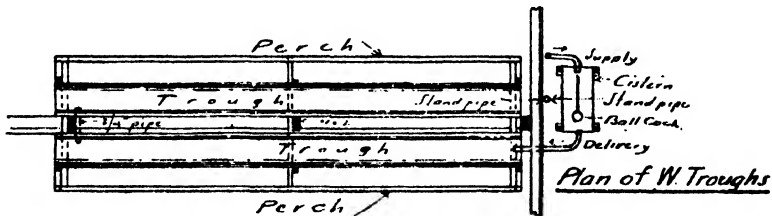


Sect. Thro Water Troughs



Part Elevat. of Water Trough.

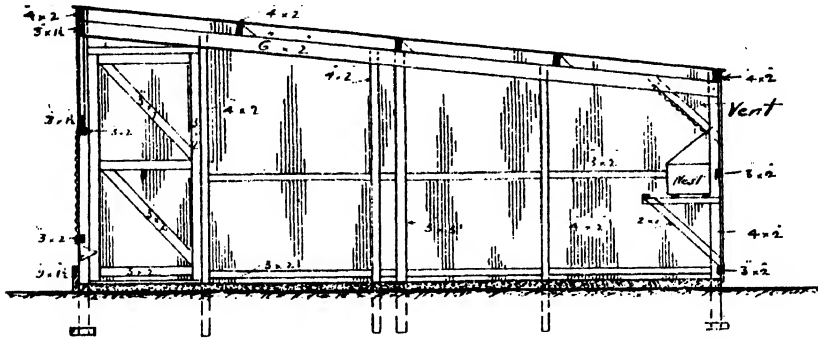
*Water Supply.*—This is controlled by a ball-cock, and is connected from a water pipe or tank. The details are explicit.



*Perches.*—As shown, i.e., leaving a passage-way, the perches will not accommodate 500 birds. The alternative is to extend the perches right across the roosting compartment, or else to put in three long perches lengthways in the passage-way shown in the roosting house. The perches may be suspended on wires or may be made on collapsible legs. They should be built in sets of three or four for convenience. Perches, 3in. x 2in. jarrah, top rounded, "joggled" into bearers 4in. x 2in. All perches must be movable.

*Floor.*—Lime concrete, finished with cement, will do. Cement concrete makes a good job. If laid on sand, 3in. thickness is ample.

*Runs.*—These are not essential, but may be provided if land is available.



*Section of Lean-to House.*

As wind pressure may, at times, be considerable, all posts of the house should be strutted at the bottom so that they will not pull out. All rafters, purlins, &c., should be either bolted or well secured by hoop-iron straps.

All gates are better if fastened with small carriage bolts instead of screws and nails.

## DEPARTMENTAL DOINGS.

*(Continued from page 90.)*

### FARM BUILDINGS, ETC.

During the month the Field Engineer (Mr. J. Paull) supplied Mr. D. McCallum, of Rudall, Eyre Peninsula, with plan of a sheep dip. He visited Mr. W. Green and Mr. T. L. Moore, of Borrika, and supplied sketch plan of proposed buildings. In the same district he also visited Mr. V. V. Brown, and supplied plans and specification for the extension of a farm house. Messrs. Loutit and Loudon, of Macclesfield, were also visited and advised in connection with the erection of farm buildings generally. The work being done in connection with the erection of a silo for Messrs. Morphett & Co., of Woods Point, was inspected, and Mr. J. Kutchel, of Mypolonga, was given information respecting the farm buildings. Similar information was supplied to Mr. H. Snow, of Rochester. This officer also visited Peterborough Butter Factory in connection with the drainage system, and Mr. Koch, of Peterborough, was supplied with information respecting the erection of a silo.

## STATE OF SOUTH AUSTRALIA—VINTAGE, 1921.

**Wine made—7,893,345galls. (55 per cent. increase).**

**Value—£993,232.**

The Government Statist (Mr. W. L. Johnston) reports that the total wine made this season was 7,893,345 (5,085,939) gallons, an increase of 2,807,406galls., or 55 per cent. on the previous season. This substantially exceeds the previous record of 6,544,125galls. in 1919.

The value of the wine made is estimated at £993,232 (£643,738). There were 78 winemakers—60 making 1,000galls. and over.

The following are the principal wine districts and the quantities made in each :—Nuriootpa, Barossa, Angaston, Tanunda, &c., 2,781,000 (1,665,000) gallons; McLaren Vale, Reynella, &c., 2,096,000 (1,192,000) gallons; River Murray 917,000 (859,000) gallons; Burnside, Magill, &c., 901,000 (513,000) gallons; Clare, Watervale, &c., 405,000 (251,000) gallons.

Of the total vintage, 3,410,468galls. of wine were made for distillation purposes—brandy and fortifying spirits for wine.

Approximately 50,035 (32,566) tons of grapes were used, yielding an average of 157·76 (156·17) gallons of wine per ton.

On June 30th last or thereabouts the stocks of wine, including the recent vintage, totalled 9,199,695 (7,101,788) gallons, an increase of 2,097,907galls. or 29·54 per cent. on the previous year.

### EXPORTS.

The special collection of details of wine exported to the other States is not yet finalised, but on present advices 1,700,000 galls., valued at £540,000 is a safe estimate. The exports to oversea countries totalled 812,915galls., valued at £159,137, a total trade of 2,500,000galls., valued at £700,000 (subject to revision) against 2,277,079galls., £599,071 the previous year.

### SUMMARY—FIVE YEARS.

Vintage.	Grapes Used.	Wine Made.		Estimated Value.	Stocks.
		Total.	Average in—		
	Tons.	Galls.	Galls.	£	Galls.
1917 .....	18,956	2,951,048	155	318,532	4,447,285
1918 .....	32,804	5,331,166	163	516,999	6,642,330
1919 .....	40,507	6,544,125	162	694,319	7,789,790
1920 .....	32,566	5,085,939	156	643,738	7,101,788
1921 .....	50,035	7,893,345	158	993,232	9,199,695
Mean last 5 years ....	34,974	5,561,124	159	633,364	7,036,178

## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on September 1st, 1921:—

**BUTTER.**—The market has shown considerable excitement during the past month owing to the increased demand from London for top grades and the bidding up of buyers from there to secure supplies. The result was that values hardened from 1½d. to 2d. per lb., but later, cable advice from London indicated an easier feeling, so that values are now slightly lower than when we last reported. It is pleasing to state that supplies show splendid increases each week, as is only to be expected with the bountiful growing season now experienced and regular shipments are going forward by each boat to London and the Continent. At the close of the month, values were:—First-grade factory and creamery in prints, 1s. 8½d. to 1s. 9d.; best separators and dairies, 1s. 6d. to 1s. 8d.; fair quality, 1s. 4d. to 1s. 5½d.; store and collectors', 1s. 2d. to 1s. 3½d.

**EGGS.**—Although supplies have shown an increase each week, the excellent export and local demand has kept the rooms well cleared during the month, and market maintained last quotations until the latest auction, when prices eased 1d per dozen, values now being:—Fresh hen, 11d.; duck, 1s.

**CHEESE.**—Rates have been well maintained during the period even with increasing supplies, and stocks are being cleared from week to week, range being from 10½d. to 11½d. per lb. for large to loaf.

**HONEY.**—This line is meeting with somewhat slow sale, and, although there have been a few parcels exported to the other States, demand has slackened, and, also, local purchasers are not too keen in operating. Prices have eased, and quotations at moment are 4d. to 4½d. for prime clear extracted; second grades, 3d.

**ALMONDS.**—These are meeting with good demand, both for local and interstate business. Rates firmed during the month, prices ranging from 1s. to 1s. 0½d. for Brandis; 11d. to 11½d. for mixed softshells; 5d. for hardshells; kernels, 1s. 11d.

**BACON.**—There is not much alteration to report in this line, supplies having kept up well. Values are a shade lower, best factory cured sides selling at 1s. 3d. to 1s. 3½d.; hams a bit slow of sale at 1s. 3d. to 1s. 4d.; lard in packets, 8½d.; bulk, 8d.

**LIVE POULTRY.**—Throughout the month keen competition was experienced in our rooms for all lots submitted, and, in comparison with meat values, poultry is selling well. With the large number of buyers operating through us, keen competition is always in evidence, and much bigger supplies could have been disposed of without seriously affecting values. At last auction the rates were:—Prime conditioned roosters, 4s. 6d. to 6s. 3d. each; nice conditioned cockerels, 3s. 9d. to 4s. 9d. each; each; plump hens, 4s. to 5s. 2d. each; light birds, 3s. 3d. to 3s. 8d. each; a few pens of weedy sorts lower; ducks, 4s. 6d. to 6s. 7d. each; geese, 7s. 6d. to 8s. 6d. each; turkeys, prime conditioned, 11½d. to 1s. 2d. per lb. live weight; fair conditioned, 10d. to 11d. per lb.; fattening sorts lower; pigeons, 9d. to 9½d. each.

**POTATOES.**—There is practically no alteration to report in this line, for, although Victorian rates have firmed a few shillings per ton, local values have remained fairly stationary. Small parcels of locals are being marketed, and values at close of month were:—Victorian Snowflakes, £6 15s. to £7 5s. per ton; Carmens, £7 5s. to £8 5s. per ton; locals £5 to £6 per ton on trucks Mile End.

**ONIONS.**—Supplies are much greater than the demand, values being:—£5 to £6 per ton on rails Mile End; £2 10s. to £3 per ton in 3-ton lots on rails Mount Gambier.

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## THE AGRICULTURAL OUTLOOK.

## REPORTS FOR THE MONTH OF AUGUST.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

*Booborowie.*—Weather—The weather has been ideal for August, light to good rains having fallen regularly throughout; 238 points of rain were registered for the month up to the time of writing. Crops are all now making good growth, and there should be some good yields, both of hay and grain, with even moderate spring rains. Natural feed is plentiful for this time of the year. Stock—All in good condition, generally speaking. Pests—Rabbits are rather numerous. Miscellaneous—Fallowing is nearly finished. Shearing is becoming general.

*Eyre Peninsula.*—Weather—Seventy-eight points of rain were recorded over nine days, and proved of little use, as the moisture was dried up by winds almost immediately; very hot at end of month. Crops—Early crops are looking well, but running up to head. Late crops are badly in need of soaking rain. Oats are doing well. Natural feed is abundant, but warm weather is causing it to seed. Stock are all in good order, and free from disease. Pests—Rabbits are becoming very numerous; have had to commence poisoning. Miscellaneous—Orchard is looking well; some stone fruits commencing to flower.

*Kybybolite.*—Weather—The month has been wet and cold, rain falling on 17 days, registering 3½ in., which is above the average for the month. Very few frosts were noted, but plenty of cold winds were received. Crops generally have made good growth, considering the cold and wet conditions. Very little fallowing has, as yet, been able to be done, but farmers are looking for a few weeks of drier weather now, so that a fair area can be fallowed, and land prepared for summer crops. Natural feed is showing thickly, and commencing to make good growth.

*Turretfield.*—Weather—142 points of rain have been recorded. This month has been on the dry side, as there were many days of drying winds and frosty mornings. Crops are backward, and will require good spring rains to make heavy hay crops. The later-sown crops should give good wheat yields. Natural feed is backward, but growing during the last fortnight. Stock is in good order; lambs are plentiful. Pests—Caterpillars are becoming numerous, and will eat a considerable amount of feed. Miscellaneous—A large area of land is being put under fallow this year. Vines are being planted by many of the farmers.

*Veitch.*—Weather—Veitch gauge registered 116 points to date for August; average for same month, 144 points. Have had hurricane winds during the month, otherwise mild weather. Crops sown before the end of June are showing up well, and are a very healthy color and good plant. Late-sown fields are showing effects of frosts, but are doing as well as late seeding can be expected to do in this district. Natural Feed—Enough feed available to keep stock going; heavy frosts last month gave this a setback. Stock—All in healthy condition. Pests—Rabbits are on the increase, and good work has been done on many farms with carbon bisulphide. Mice have to be guarded against. Miscellaneous—Fallowing work is proceeding well. Yellow daisy (*Senecio laetuis*) is again this season over-running fields; is good sheep feed, otherwise useless.

## MURRAY BRIDGE HERD TESTING SOCIETY.

## RESULTS OF BUTTERFAT TESTS FOR MAY, 1921.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during May.	Per Cow during May.	Per Cow October to May.	Per Herd during May.	Per Cow during May.	Per Cow October to May.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/A	12	9.42	7,180	598.33	4,360.23	372.08	31.01	204.81
1/B	14	12.68	4,342	310.14	4,709.22	221.74	15.84	206.37
1/C	44.52	34.77	24,463	549.53	4,360.92	1,123.65	25.24	177.77
1/D	18.10	13.90	10,302	569.27	3,630.63	545.22	30.13	179.33
1/E	15	14.39	9,646	643.07	4,394.40	459.96	30.66	208.87
1/F	11	10.23	3,716.5	337.86	4,076.63	178.25	16.20	168.47
1/G	49.39	45.97	43,523.5	881.27	6,518.40	1,690.31	34.23	246.13
1/H	13	10.94	5,022.5	386.33	3,842.19	242.34	18.64	166.64
1/I	10	10	5,781.5	578.15	5,030.89	259.34	25.93	210.91
1/J	16	13.90	7,097	443.56	5,033.26	366.56	22.91	226.28
1/K	13	13	8,230.5	633.12	4,390.57	407.05	31.31	193.48
1/L	12.65	10.61	4,976.5	393.55	4,175.12	252.32	19.95	189.94
1/M	15.58	12.58	3,999	256.66	3,112.84	212.39	13.63	145.83
1/N	—	—	—	—	2,301.68	—	—	100.07†
1/O	29.65	21.48	14,807.5	499.49	2,816.77	721.20	24.33	130.26*
1/P	18	16	7,285	404.72	2,770.85	372.49	20.69	123.24*
1/Q	—	—	—	—	1,241.91	—	—	49.01†
1/R	9	9	5,859	651.00	651.00	268.53	29.84	29.84†
MEANS	18.81	16.18	10,389.47	552.47	454.33	480.84	25.57	194.61

\* For six months only.

† For one month only.

‡ Herd "N" withdrew after four months; herd "Q" withdrew after two months.

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Offices: 22, King William Street, Adelaide.

**A REMINDER TO PROPERTY OWNERS !**

Men spend their time and effort in acquiring property in order to achieve financial independence. To this end they engage their resources in business and other industries, or they seek safe and profitable investments. In all these activities they direct vigorous efforts towards the protection of their property. During their lives they endeavor to guard against every change which may lessen or damage their resources, but their plans for obtaining safety often fail to take into account the one thing which is sure to happen—the death of the planner. Many owners of property seldom consider how their property is to be managed after their death to support those for whom it is their duty to provide.

**HAVE YOU TAKEN STEPS SO THAT YOUR POSSESSIONS WILL  
BE ADEQUATELY PROTECTED AFTER YOUR DEATH ?**

WRITE OR CALL FOR FREE BOOKLET.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

### CONFERENCE OF PINNAROO LINE BRANCHES.

Parilla was the meeting place of the representatives of Branches of the Agricultural Bureau situated along the Pinnaroo line of railway. The Conference was held on August 25th, and was opened by Captain S. A. White, C.M.B.O.U. (member of the Advisory Board). The opening address was followed by a paper, "Preparation of a Seed Bed," by Mr. E. T. Trowbridge (Lameroo Branch), and an address by the Government Dairy Expert (Mr. P. H. Suter). Mr. E. H. Parsons (Pinnaroo) opened the afternoon session with a paper, entitled, "Takeall," after which the Director of Agriculture replied to a number of questions previously submitted. The following resolutions were carried:—(a) "That this Conference favors a series of lectures and demonstrations at centres along the Pinnaroo line of railway by Government veterinary surgeons." (b) "That this Conference favors bulk weighing of wheat in preference to the prevailing system." (c) "That a meeting of representatives of the Pinnaroo line Branches should be held to consider steps to secure the services of a veterinary surgeon." (Mr. A. J. Koch, Lameroo, was appointed convenor.) (d) "That the Railways Commissioner be requested to so issue all rail tickets from long distances as to enable passengers to break the forward journey within reasonable distance of the city." (e) "That this Conference brings under the notice of the Advisory Board of Agriculture the great losses to wheatgrowers from takeall, and requests that steps be taken to overcome the trouble." (f) "That this Conference favors the establishment of a southern port, as an outlet for Murray land produce." At the evening session, Mr. J. Gray (Claypan Bore Branch) read a paper, "The Advisability of Using Pure-bred Sires for all Kinds of Stock." A lecture, illustrated with lantern views, by Captain S. A. White, C.M.B.O.U., followed. It was decided that next year's Conference should be held at Pinnaroo.

### CONFERENCE OF SOUTHERN BRANCHES.

On August 18th representatives of the Southern District Branches of the Agricultural Bureau met in Conference at Port Elliot. The chair was occupied by Mr. J. Hamilton Welch, who extended a welcome to the visitors and representatives of the Department of Agriculture. The opening address was delivered by the Minister of Agriculture (Hon. T. Pascoe, M.L.C.), following which Mr. H. Lehmann (Hartley Branch) read a paper, entitled, "Purchasing a Farm." The afternoon session was inaugurated by a paper by Mr. J. Brown (Port Elliot), on the subject, "Irrigation." Time was then devoted to Free Parliament. A resolution was carried urging the Government to



simplify the income tax returns for farmers. Various questions submitted by the Branches were replied to by the Director of Agriculture (Professor A. J. Perkins), following which Mr. W. H. Giles (Milang Branch) submitted a paper, "How I Work my Farm," and Mr. J. Hamilton Welch a paper, "Are Artificial Manures Beneficial?" At the evening session Mr. W. E. Hargreaves submitted a paper, "Olive and Pine Growing in the South." The balance of the evening was taken up by the Lecturer in Forestry of the Adelaide University (Mr. H. H. Corbin, B.Sc.), who delivered an illustrated lantern lecture. The Conference decided that the next gathering should be held at Milang in 1922.

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**WALLAROO M. L. YELL**

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## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held on Wednesday, August 10th, there being present Messrs. C. J. Tuckwell (Chairman), T. H. Williams (Chief Inspector of Stock), W. S. Kelly, W. J. Colebatch, F. Coleman, and H. J. Finnis (Secretary).

*Library for Bureau Branches.*—This matter was again brought before the Board, and, after discussion, it was decided, on the motion of Mr. Colebatch, that Messrs. C. J. Tuckwell and W. S. Kelly be appointed by the Board to place the matter before the Minister and obtain his sanction to certain suggestions.

*New Branches.*—New Branches were formed at Windsor and Maltee with the following gentlemen as members:—Windsor—G. Price, L. Pritchard, B. McArdle, C. Baker, A. Carter, A. Baker, H. Williams, R. Williams, W. Tonkin, W. Carter, N. Baker, G. Price, jun., H. White, E. Williams, C. Carter, S. White, H. Clark, E. Jenkins, M. Jones, H. Lyons; Maltee—J. O. Shorne, E. D. Barnett, W. W. Barnett, J. W. Barsham, H. J. Schwarz, R. Edson, S. M. Martin, J. B. Talbot, E. T. Schwarz.

The Wepowie and Penong Branches of the Agricultural Bureau were closed.

*New Members.*—The following names were added to the rolls of existing Branches:—Kilkerran—A. Sawade; Pinnaroo—R. Pritchard; Glossop—Bott, R. Priest; Ironbank—G. Pole; Parilla Well—G. A. Schultz; Kalangadoo—R. J. Messenger, J. Allechin, E. V. Bennett, L. G. Dean; Glencoe—P. Millowick, A. Tregenza; McLachlin—H. Mavis, J. L. Norman; Morehard—R. T. Fabbian; Yacka—J. Jenkins, A. Crawford, S. H. Harvey; Beetaloo Valley—F. Bartrum; Booleroo Centre—D. D. Smith, C. Innis; Lone Gum—E. R. Whitelaw; Murray Bridge—J. Venning; Willowie—F. G. Blight, J. Tilbrook, L. Tilbrook; Mundalla—H. Warland; Alawoona—H. Andrews, J. Whiting, C. Lonnarn, C. P. George; Arthurton—W. Colliver; Two Wells—W. B. Williams; Ironbank—I. Morgan; Meadows—W. H. Thomas; Rosedale—H. Koch, E. Koch; Miltalie—W. H. Wheeler; Roberts and Verran—H. A. Simmons; Barmera—W. H. James, R. G. Hallam, H. Sando, H. C. Gittins, A. H. Baynes, E. Patton; Williamstown—J. J. Philp, C. G. Fromm; Rockwood—S. Collett, E. R. Heath, C. F. Rogers, J. H. Simmons; Ashbourne—C. Pitt, G. Pitt; Bute—W. G. Fidge, jun.; Ramco—E. Rohrlach, E. Milne; Blyth—M. O. Malley; Coonawarra—W. Snelling, W. McLean; Lameroo—L. E. Crispe, W. B. Crispe; Renmark—J. McGregor, E. H. Cornish, W. B. Creer, L. Vowser, G. Hamister; Morphett Vale—S. H. Marshall; Black Springs—J. Heinrich, H. Wardle; Moonta—J. Warmington, E. C. Atkinson; Orreroo—A. C. Moody, W. Toop, sen.; Butler—J. G. S. Morgan; Maitland—A. W. Kelly; Minnipa—R. P. B. Visser. R. Hill, J. Daly, P. C. Boylan, W. Head, E. W. Grubb; Glencoe—R. A. J. Sinclair; Lone Pine—T. Koch, V. Schmidt, P. Gabel, C. Spaeth, C. Baum, H. Hoyle; Naracoorte—J. L. Nagel; Alawoona—L. A. Kubule; Wynarka—T. J. Ninnes.

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of August, 1921, also the average precipitation to the end of August, and the average annual rainfall.

Station.	For Aug., 1921.	To end Aug., 1921.	A'v'ge to end Aug.	A'v'ge. Annual Rainfall	Station.	For Aug., 1921.	To end Aug., 1921.	A'v'ge. to end Aug.	A'v'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.					LOWER NORTH—continued.				
Oodnadatta .....	0.37	6.50	3.13	4.73	Spalding .....	2.44	16.88	13.29	20.18
Marree .....	0.28	4.37	4.04	6.02	Gulnare .....	2.61	15.62	12.72	18.97
Farina .....	0.22	5.54	4.56	6.57	Yacka .....	2.13	14.72	10.57	15.27
Copley .....	0.35	7.91	5.85	8.30	Koolunga .....	2.20	15.49	10.94	15.73
Beltana .....	0.57	8.63	6.09	8.93	Snowtown .....	1.94	16.24	11.40	15.87
Blinman .....	1.00	9.73	8.81	12.52	Brinkworth .....	2.17	14.01	11.14	15.91
Taroocla .....	0.57	12.96	4.89	7.33	Blyth .....	1.84	17.54	11.56	16.65
Hookina .....	1.28	16.61	8.91	12.65	Clare .....	3.58	21.39	17.15	24.47
Hawker .....	1.27	18.45	8.72	12.37	Mintaro .....	3.17	18.77	16.06	23.07
Wilson .....	1.23	18.23	8.34	11.85	Watervale .....	4.47	19.69	15.93	27.48
Gordon .....	0.96	21.65	7.18	10.43	Auburn .....	3.42	19.64	16.85	17.82
Quorn .....	1.14	20.84	9.71	13.79	Hoyleton .....	1.92	15.03	12.29	15.82
Port Augusta .....	0.69	17.10	6.37	9.42	Balaklava .....	1.76	12.86	10.93	13.14
Port Augusta West .....	0.70	16.49	6.25	9.36	Port Wakefield .....	1.40	14.59	9.49	13.54
Bruce .....	0.62	16.81	6.03	9.99	Terowie .....	1.55	15.08	8.94	13.97
Hammond .....	1.18	24.43	7.72	11.36	Yarcowie .....	1.60	15.70	9.40	13.64
Wilmington .....	1.25	15.25	12.55	18.06	Hallett .....	2.04	15.14	10.91	16.28
Willowie .....	0.80	24.67	10.01	11.82	Mount Bryan .....	2.17	16.29	10.99	16.38
Melrose .....	1.70	17.16	16.34	23.11	Burra .....	2.27	17.19	12.37	17.91
Booleroo Centre .....	1.80	17.14	10.52	15.51	Farrell's Flat .....	1.73	16.68	13.10	18.87
Port Germein .....	0.80	19.02	8.57	12.65	WEST OF MURRAY RANGE.				
Wirrabara .....	1.84	15.11	13.59	19.44	Manoora .....	2.70	15.89	12.48	18.64
Appila .....	1.26	19.86	9.41	14.90	Saddleworth .....	2.01	15.51	13.67	19.75
Cradock .....	1.12	18.44	7.43	10.82	Marrabel .....	2.40	18.22	13.50	19.44
Carrieton .....	1.27	20.95	8.54	12.34	Riverton .....	2.51	14.08	15.38	20.74
Johnburg .....	0.96	16.30	6.95	10.22	Tarlee .....	1.83	12.21	12.08	17.86
Eurelia .....	1.02	19.59	9.04	13.11	Stockport .....	1.71	14.22	11.00	16.36
Orroroo .....	1.03	18.48	9.33	13.42	Hamley Bridge .....	1.41	13.12	11.31	16.62
Nackara .....	1.07	17.99	7.61	10.63	Kapunda .....	2.16	14.31	13.72	19.85
Black Rock .....	1.22	13.23	8.56	12.29	Freeling .....	1.67	11.57	12.29	17.95
Ucoita .....	1.20	13.32	7.99	11.65	Greenock .....	2.20	14.80	14.83	21.73
Peterborough .....	1.58	14.06	8.89	13.82	Truro .....	1.60	17.49	13.89	20.18
Yongala .....	1.62	14.87	9.55	14.13	Stockwell .....	1.48	14.86	13.93	20.40
LOWER NORTH-EAST.					Nuriootpa .....	1.71	15.70	14.52	21.09
Yunta .....	0.75	13.56	5.73	8.50	Angaston .....	2.02	16.54	15.17	22.33
Waukaringa .....	0.57	11.03	5.54	8.14	Tanunda .....	2.01	15.02	15.54	22.54
Mannahill .....	0.58	15.25	5.60	8.51	Lyndoch .....	1.89	15.75	16.00	22.81
Cockburn .....	0.44	—	—	8.03	Williamstown .....	2.56	15.55	21.02	27.74
Broken Hill, N.S.W. ....	0.93	12.83	6.68	9.98	ADELAIDE PLAINS.				
LOWER NORTH.					Mallala .....	1.93	13.32	11.61	16.61
Port Pirie .....	1.36	17.38	9.08	13.26	Roseworthy .....	1.22	11.26	11.96	17.37
Port Broughton .....	1.73	15.28	9.95	14.13	Gawler .....	1.60	12.44	13.07	19.14
Bute .....	2.41	16.24	11.21	15.55	Two Wells .....	0.93	10.22	11.35	15.91
Laura .....	1.68	16.21	12.28	18.12	Virginia .....	1.38	11.26	12.32	17.11
Calowrie .....	1.59	16.50	11.32	17.02	Smithfield .....	1.45	10.47	11.94	17.33
Jamestown .....	2.82	16.78	11.77	17.56	Salisbury .....	1.49	10.95	13.37	18.62
Bundaleer W. Wks. ....	2.74	16.17	11.57	17.56	North Adelaide .....	2.86	17.97	15.65	21.87
Gladstone .....	1.36	14.83	10.69	16.05	Adelaide .....	2.20	15.06	15.19	21.01
Crystal Brook .....	1.55	19.07	10.70	15.62	Glenelg .....	1.84	12.09	13.31	18.42
Georgetown .....	2.26	16.16	12.55	18.30	Brighton .....	2.59	15.99	15.16	21.03
Narriady .....	1.21	13.54	11.30	16.43	Mitcham .....	3.19	16.90	17.39	23.68
Redhill .....	2.61	19.37	11.77	16.66	Glen Osmond .....	2.97	17.02	19.76	25.73
					Magill .....	2.55	14.72	18.37	25.38

## RAINFALL—continued.

Station.	For Aug., 1921.	To end Aug., 1921.	Av'ge. to end Aug.	Av'ge. Annual rainfall	Station.	For Aug., 1921.	To end Aug., 1921.	Av'ge. to end Aug.	Av'ge. Annual rainfall
<b>MOUNT LOFTY RANGES.</b>					<b>WEST OF SPENCER'S GULF—continued.</b>				
Teetree Gully.....	2-39	15-83	19-87	27-73	Port Lincoln.....	2-38	11-83	14-88	19-83
Stirling West.....	5-16	28-23	34-23	46-82	Tumby.....	1-36	13-65	10-01	14-76
Uraidla.....	4-24	24-72	32-52	44-49	Carrow.....	0-96	12-83	9-28	15-14
Clarendon.....	2-74	22-31	24-19	33-18	Arno Bay.....	0-75	14-18	8-73	13-10
Morphett Vale.....	2-15	16-00	16-33	22-90	Cleve.....	0-92	17-00	—	—
Noarlunga.....	1-89	14-76	14-73	20-21	Cowell.....	0-61	9-10	7-89	11-56
Willunga.....	2-19	18-59	15-91	25-82	Point Lowly.....	0-51	19-91	7-67	11-84
Aldinga.....	1-62	17-17	14-76	20-22					
Myponga.....	2-98	18-37	—	—	<b>YORKE PENINSULA.</b>				
Normanville.....	1-77	20-51	15-14	20-53	Wallaroo.....	2-45	16-86	10-28	14-11
Yankalilla.....	1-86	18-17	19-09	22-93	Kadina.....	2-06	17-68	11-66	15-93
Mount Pleasant.....	3-36	21-93	19-27	27-01	Moonta.....	2-10	16-41	11-26	15-93
Birdwood.....	3-70	19-20	20-06	29-43	Green's Plains.....	2-17	15-51	11-47	15-75
Gumeracha.....	4-47	22-49	23-96	33-33	Maitland.....	2-51	18-38	14-72	20-20
Millbrook Rivr.....	4-71	21-83	—	—	Ardrossan.....	2-08	15-72	10-05	13-96
Tweedvale.....	3-85	22-65	25-84	35-60	Port Victoria.....	2-30	15-19	11-23	15-34
Woodside.....	3-43	21-68	22-97	32-05	Curramulka.....	1-87	13-15	13-26	18-31
Ambleside.....	2-90	22-52	24-59	34-81	Minlaton.....	2-29	15-44	13-10	17-70
Nairne.....	2-14	17-17	20-20	28-58	Brentwood.....	2-38	15-56	11-12	15-44
Mount Barker.....	3-02	21-15	21-21	31-10	Stansbury.....	1-84	14-44	12-07	17-08
Echunga.....	3-24	21-15	23-69	32-94	Warooka.....	1-89	16-07	13-21	17-74
Macclesfield.....	3-06	18-28	21-48	30-60	Yorketown.....	1-50	14-04	12-59	17-29
Meadows.....	3-72	22-55	26-61	36-26	Edithburgh.....	1-19	12-91	12-07	16-58
Strathalbyn.....	1-91	14-06	13-59	19-28					
<b>MURRAY FLATS AND VALLEY.</b>					<b>SOUTH AND SOUTH-EAST.</b>				
Meningie.....	2-70	12-18	13-29	18-77	Cape Borda.....	5-59	20-98	19-54	24-96
Milang.....	1-67	9-80	10-95	15-56	Kingscote.....	2-50	14-86	14-31	18-92
Langhorne's Bdge.....	1-68	12-12	9-88	14-59	Penneshaw.....	2-35	14-61	13-44	21-39
Wellington.....	1-92	12-54	9-92	14-82	Victor Harbor.....	2-17	13-85	15-42	21-56
Tallem Bend.....	1-60	13-14	9-09	24-55	Port Elliot.....	2-55	14-88	14-32	20-00
Murray Bridge.....	1-16	12-20	9-33	13-98	Goolwa.....	1-63	14-52	12-79	17-87
Callington.....	1-52	10-63	10-61	15-45	Karoonda.....	2-21	15-36	—	—
Mannum.....	0-98	11-96	7-97	11-51	Mindarie.....	1-11	8-44	—	—
Palmer.....	1-08	13-16	10-15	15-23	Meribah.....	1-32	8-85	—	—
Sedan.....	0-84	13-11	8-41	12-07	Pinnaroo.....	1-46	16-36	9-96	15-67
Swan Reach.....	1-12	13-58	6-91	10-80	Parilla.....	1-87	12-39	10-14	14-02
Blanchetown.....	0-49	9-43	6-78	10-26	Lameroo.....	1-75	12-59	9-47	16-45
Eudunda.....	1-04	13-87	11-96	17-51	Parrakie.....	1-93	11-03	9-16	14-42
Sutherlands.....	0-83	11-73	8-08	10-90	Geranium.....	2-14	12-78	10-51	16-24
Morgan.....	0-75	11-81	5-79	9-13	Peake.....	2-34	12-34	10-56	16-25
Waikerie.....	0-78	10-35	6-03	9-41	Cooke's Plains.....	2-20	13-63	10-08	15-00
Overland Corner.....	0-80	8-49	7-09	11-11	Coomandook.....	2-81	15-93	11-82	17-75
Loxton.....	1-28	9-23	8-04	12-27	Coonalpyn.....	2-60	11-03	11-01	17-64
Renmark.....	1-39	10-24	6-84	10-92	Tintinara.....	2-83	11-71	12-54	18-83
<b>WEST OF SPENCER'S GULF.</b>					Keith.....	2-54	12-83	12-08	18-54
Eudla.....	0-79	5-80	7-41	10-03	Bordertown.....	2-14	12-60	13-08	19-52
White Well.....	0-88	—	6-43	9-24	Wolsley.....	2-19	12-87	12-09	18-07
Fowler's Bay.....	1-03	9-01	9-49	12-11	Frances.....	2-77	12-30	13-09	20-10
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Smoky Bay.....	0-98	9-10	7-50	10-37	Lucindale.....	3-04	—	16-34	22-93
Petina.....	1-11	10-45	9-50	12-97	Kingston.....	3-58	—	15-35	24-51
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Cummins.....	2-30	13-72	—	—	Kalangadoo.....	5-05	20-14	—	—
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## AGRICULTURAL BUREAU REPORTS.

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Angaston .....	*	—	—	Gawler River .....	*	19	17
Appila-Yarrowie .....	*	—	—	Georgetown .....	*	17	16
Arthurton .....	†	—	—	Geranium .....	†	24	29
Ashbourne .....	*	—	—	Gladstone .....	162	17	15
Balakiava .....	*	10	8	Glencoe .....	†	—	—
Balhannah .....	*	17	7	Glossop .....	167	—	—
Barmera .....	*	16	14	Goode .....	*	14	19
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Berri .....	†	14	19	Halidon .....	*	—	—
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Mount Bryan .....	†	—	—	Stockport .....	*	—	—
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Mundoora .....	*	19	17	Uraidla & Summertown	*	5	3
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Myponga .....	*	—	—	Waikerie .....	*	—	—
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Narridy .....	†	17	15	Warcowie .....	*	—	—
Narrung .....	171	17	15	Watervale .....	†	—	—
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Netherton .....	†	9	14	Wilkawatt .....	†	17	15
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\* No report received during the month of August.

† Held over until next month.

‡ Annual meeting.

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## REPORTS OF BUREAU MEETINGS.

### UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

MORCHARD (Average annual rainfall, 13.50in.).

July 16th.—Present: 15 members.

**ELECTRIFICATION OF SEED WHEAT.**—In the course of a short paper on this subject, Mr. H. A. Toop said one of the latest experiments in inducing wheat to be more productive was the electrification of the seed sown. Although only in its infancy, the experiment seemed to promise returns equal to that of superphosphate. It had, up to the present, only been used on a very few farms, but the results had been very much in its favor. Reports showed that it was a fairly simple process to treat the seed, a common medical battery being used to electrify the water in which the wheat was placed. The results proved a better and quicker germination, a stronger and healthier plant, and better grain; and also that the treatment could be applied with equal success on other seeds as well. Such results proved that there was a great possibility for the system in almost every branch of agriculture, and it was the Branches who should be the first to try the innovation.

TARCOWIE (Average annual rainfall, about 15 $\frac{1}{2}$ in.).

July 19th.—Present: 14 members and two visitors.

**CULTIVATION OF THE SOIL.**—In the course of a paper under the heading, "Fallowing and Working the Soil for the Growing of Wheat," Mr. P. Smith said the conditions of that district made it imperative that the farmer should fallow the land if the best returns were to be obtained from the wheat crop. The work should be performed with a stump-jump implement, each share cutting 9in. to the furrow. He was of the opinion that the R/L mouldboard, with a small

piece cut off the end, did a much better job than the pronged board. If the land was inclined to be stiff, one should work the plough with at least two horses to each furrow. If the subsoil was shallow he did not think it would do any harm to turn up about 1 in. of clay, because it could soon be worked into the surface soil, and would tend to increase the depth of earth in the shallow places of the field. The mouldboards should be kept clean, in order that they would be able to turn the soil over evenly. After fallowing, the land should be left for a few weeks, in order to obtain the benefit of the sun and air. After that the harrows could be run over the land, across the ploughing. If possible the cultivator should be worked across the ploughing, as that tended to make the surface of the soil level. If thorough cultivation was carried out, the work in connection with seeding operations for the following year would be considerably lightened, as one would have destroyed the greater part of the summer weeds. The growing crops were almost entirely dependent upon the retaining propensities of the soil, and if the implements were simply skimmed over the surface of the land, the weeds would not be destroyed, and the ground would remain stiff and hard throughout the summer. After cultivating has been completed, he strongly advocated working the soil with heavy harrows, preferably in fine weather, just after a rain had fallen. If the fallow was still rough, a rib roller could be worked after harvest to make a nice soil surface. The rest of the weeds, he felt sure, could be kept in check by a flock of sheep. In the discussion that followed, Mr. W. S. Ninnes thought the plain mouldboards very difficult to keep clean, especially when the plough was working in sticky soil. He agreed as to the benefits that were to be obtained from the use of a rib roller. Mr. H. Edwards thought there was no doubt that the prongboards made the draught of the implement considerably lighter, but the plain mouldboard was best when the land was clean and in good condition. Messrs. C. A. Kotz and E. Harvie spoke in favor of the prongboard. Mr. W. H. Thomas was of the opinion that 9 in. was too wide for each furrow of the plough to cut, because as a rule the shares were only 8 in. in width.

**CRADOCK, July 23rd.**—The meeting was devoted to a discussion on the best means of awakening fresh interest in the work of the Branch.

**HAWKER, June 21st.**—Members met for the purpose of discussing what steps could be taken to stimulate interest in the work of the Branch. It was decided to draw up a programme of meetings at which papers dealing with various phases of agriculture would be read. A further meeting was held on July 9th, when the delegates for the Annual Congress were appointed. Other matters of local importance were also brought before the meeting.

**ORROROO, July 16th.**—Mr. A. L. Brice contributed a paper, "Treeplanting," and a very interesting discussion followed. The matter of the destruction of noxious weeds was also brought before the meeting.

**WILMINGTON, July 20th.**—A lengthy discussion took place on the destruction of noxious weeds.

## MIDDLE-NORTH DISTRICT.

### (PETERBOROUGH TO FARRELL'S FLAT.)

**BEETALOO VALLEY** (Average annual rainfall, 18 in. to 19 in.).

July 20th.—Present: 13 members and visitors.

**BREEDS OF CATTLE.**—The following paper was read by the Chairman (Mr. J. McIntosh):—"The Durham Shorthorn has no rival as a beef breed of cattle. They are easily fattened, are particularly quiet, and the meat is of a very high quality. The pure-bred animals are not extra large, but when crossed with other types they grow to an immense size, and are suited to almost any country or climate. The cows, as a rule, are heavy milkers, are easy to milk, but weak in butter fat. The colors are red, white, or roan. Points in the general conformities to be observed are straight backs, heavy shoulders, standing close to the ground, heavy tails, with soft silky hair, small horns sloping downwards, and large prominent eyes. Any beast showing a sign of a brown nose or dark markings should be discarded.



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The Herefords are a firm robust breed, and will thrive well on any country. The steers are very hardy, and make fine working bullocks. The meat is coarser than the Shorthorn, and the cows, as a rule are very poor milkers. The Ayrshires are a very handsome and hardy breed, and good foragers. They are suitable for rough hilly country. The cows are good milkers, rich in butter fat, easily fattened, and grow to a good size for beef. At one time the Ayrshire was not in favor with the dairymen, on account of the smallness of the teats, but of late years this fault has been remedied, and, at present, the breed is much sought after. As a general milking breed, there is nothing better than the milking Shorthorn. They are opposite in appearance to the beef Shorthorn, being lean and muscular, wedge shaped, with well developed udders, fine large teats, and are easy milkers. The colors are the same as the beef strain. They are reliable breeders, mature quickly, splendid milkers, and rich in butter fat. The cows are very quiet, and are ideal farm cattle, suitable for any climate. The steers make good workers, and when properly fed and cared for develop into fine beasts for the market. The Jersey is not as hardy as most of the other breeds mentioned, but they are good milkers, and very rich butter cows, but slow in coming to maturity. The young stock are weakly, and the breed as a beef strain are rather in the background, the meat being a dark color and tough. The Kerry is a very handsome cow, but like the Jersey is very small, standing on short legs, with a square body. They are splendid milkers, and very suitable for small holdings or town houses, where only one or two cows are kept. They will feed on almost any scraps from the kitchen, such as apple or potato peelings. They thrive well in almost any climate and are easily fattened; average weight about 600lbs. Another fine strain is the Red Danish Shorthorn. They are credited with producing rich milk, and like other Shorthorn breeds, are quiet and favored by the butchers as being good beef cattle, and suitable to any climate or condition, mature early, and grow to a fine size when well cared for. There are also the Swiss, and the Holstein; both are good milkers, grow and fatten well when conditions are favorable. Feed your stock well, and provide good shelter, and good results will follow."

**THE HANDY MAN ON THE FARM.**—In the course of a paper dealing with this subject, Mr. C. C. Cox said to run the farm on economical lines the farmer should always be ready and able to do all sorts of jobs, such as the overhauling and repairing of the implements, so that they would be ready when required. He should also be able to repair harness and boots, attend to collars, and try to prevent horses from getting sore shoulders. If one was able to shoe horses, much time would be saved. Horses with shoes on were able to get along much better in rough country, and they were also easier to keep in good condition. The fences should be kept in repair, and with waste gas pipe, or other suitable material, one could make good, substantial, and serviceable gates. Attention should also be given to the buildings and sheds, and one should see that tools, &c., were not left exposed to all weathers. The guttering around the house and other buildings should be cleaned out, and the leaks soldered. Proper care should be given to the teams and all farm stock. Other necessary jobs enumerated by the writer were as follows:—Keep the house well supplied with firewood; have the horse feed in when the teams return from the paddock at dinner time and evening; attend to a few fruit trees and vines; grow vegetables for the household; keep the stable or yard cleaned out, and spread the manure on the land; also keep the cow yard, pigsty, and fowlhouses in a sanitary condition.

**BLYTH** (Average annual rainfall, 16.46in.).

July 23rd.—Present: 17 members and three visitors.

**THE AGRICULTURAL BUREAU.**—Mr. W. O. Eime, who contributed a paper dealing with this subject, said it was to the advantage of every person connected with agriculture to become a member of the Agricultural Bureau. There was practically no branch of agriculture that did not come within the scope of the Agricultural Department, and if any member of any Branch desired any information on matters relating to wheat-growing, horticulture, poultry-keeping, dairying, or stock inquiries, all that was necessary for them to do was to communicate with the officers of the Department, who were always willing to give the man on the land the benefit of their knowledge. He believed it would be a good plan if each member of the Branch resolved to secure at least one new member during the coming year. The speaker believed that a greater interest

would be stimulated if an occasional evening was devoted to a "Question Box." Each member could be allowed to ask a question, and the subjects allotted to different members to answer at the next meeting. He was also of the opinion that the holding of homestead meetings from time to time was an excellent way of stimulating a keener interest in the work of the Branch. The annual report was then presented, and the officers were elected for the coming year.

#### BOOLEROO CENTRE (Average annual rainfall, 15.83in.).

July 15th.—Present: six members.

CARE OF HARNESS.—Mr. W. Mills, who contributed a paper on this subject, said harness was such an expensive item that it should be properly cared for, and put away when not in use. He suggested hanging the collars on a peg rather than over a rail, because the continual stretching of the throat of the collar when putting it over the rail tended to weaken the pipe. The winkers should be hung on pegs by themselves; about four pairs to each peg was sufficient. They should be hung so that the eye flaps came inside the next pair that were put on. When the harness was in constant use in the fields, and it was impossible to take it home, it should be placed flat on the ground and covered with a few old bags stitched together. For team work in the field he would use cotton rope with leather ends for reins. They should be cut in halves where they were held, because if that was not done they would become twisted, and it would be impossible to get them straight again. The two ends could be fastened together during the day for the convenience of the driver, but untied again before being put away in the evening. A mixture of mutton fat and neatsfoot oil in equal proportions should be used for oiling the harness. The mutton fat should be melted in an old saucepan, and the oil stirred in while the fat was hot. The mixture should be rubbed into the leather about twice a year, and with a little care and attention in the ways mentioned the cost of upkeep would be considerably reduced. A good discussion followed the reading of the paper.

#### MINTARO.

July 16th.—Present: 15 members.

CARE OF HORSES.—In a paper dealing with this subject, Mr. D. Garrett said if one wished to raise good horses it was natural that care should be taken of the foals. If there was not a convenient paddock with a good supply of green feed available, the mare should be fed on chaff, with a little bran or crushed corn. On no account did he think the mare should be worked until the foal was at least six months old, because before that age it would be too young to follow its mother about or stay at home by itself. If it was necessary to work the mare, the foal should be shut up in a loose box or a closed-in shed, and given a small feed and a supply of water. One should endeavor to avoid handling the foal as much as possible, and he thought it a mistake to try and tie it up. The foal could be weaned at six months old, but it should be well fed until there was plenty of green feed in the paddocks. The colts should always be fed from March until there was an abundance of green feed available for them. A stack of straw erected in the grass paddock would afford an excellent shelter for the animals during the cold winter months. At three years old the colt should be broken in. The following practice was suggested by the speaker for handling the young animal:—"To break in a colt, catch it quietly; put on an open head stall with a very thick bit; pass a rope around the neck and through a strap under the jaw, so that the horse may be led or guided from either side; have a loop on the end of the rope, and slip it over a strong post planted in the middle of the yard; stand between the horse and the post, so that the rope will be tight from the horse to the post, to prevent jerking the neck; and walk the horse around both ways, to make both sides of the mouth alike. The horse will learn to guide more quickly if not put out of a walk. When the colt has been driven around the post for a short time it will find it cannot get away, and will soon learn to give to the rein. Teach it to lead and to back and to tie up. Pick up all its feet several times during the first day or two, and after that you will have no trouble in shoeing. The horse might be harnessed, and left to stand in the yard for a time, and chew the bit, and in this way it will educate itself. The handling of a horse for two days before riding or working it is time well spent, and if done on the lines suggested is only a one-man

job." The speaker went on to say that a draught colt should only be worked for a few hours each day, so that it would gradually become hardened to its duties. The neck and shoulders should be washed each day with a solution of salt and water, and if the neck became scalded a lather of soap and water should be made, and allowed to dry on the skin. In the morning the neck could be washed, but the shoulders should not be washed before the animal commenced work. He believed in putting the colt to work in the shafts of the wagon, because in such a position it was practically unable to hurt itself. If possible, one should make a practice of breaking in the colts at home, for it was not an uncommon occurrence for the animals to fret and lose condition when taken to a strange place. Referring to the feeding of the horses, the speaker thought it advisable to have all coarse hay chaffed before giving it to the stock. Crushed wheat or barley made a good corn ration, but the speaker expressed a preference for oats. Bran was recommended for horses grazing on clean country, but on sandy or dusty land pollard should be added to the chaff. During the winter months the horses should, if possible, be given an allowance of green feed. A large and roomy stable should be erected on rising ground, in order to provide for good drainage. He favored the practice of leaving the animals loose at night, and would place the trough at some little distance from the stalls, so that the horses would not foul the water. Medicine should only be administered to sick horses by capable hands. When the team was being driven up a hill or through a heavy pull, they should not be rushed, but allowed to take their time. In the discussion that followed, Mr. Blatchford favored putting the colts straight to work. Mr. H. Schunke thought it best to handle the foals and tie them up. He thought a day or two well spent in teaching the colt to lead, guide with reins, and to back. He preferred putting the young horse in the body of a tandem team. Mr. W. Jones liked to handle the foal, and would break it in at two and a half years old. Mr. S. J. Mitchell never washed his horses' shoulders, and never had but one horse get sore shoulders. Mr. D. Garrett, jun., favored tying up the foals. He preferred feeding crushed oats to the horses. Mr. D. Kelly thought that horses required careful treatment when working on damp, foggy mornings, as they became overheated, and scalded their shoulders. He did not believe in tying the colt to a post. He usually handled them until they were quite quiet before riding or putting them in a team. He considered the harrows or a small team the best place for working the colt. Mr. McNamara believed in watering horses before feeding, and in washing their shoulders after work. The following recipe would make a good ointment for horses' shoulders:—One teaspoonful of iodoform, 1oz. blacklead, and 2oz. lard, thoroughly mixed together. Mr. Garrett, sen., in reply to questions, stated that he preferred pollard to bran for sandy districts, as it would mix with the sand, and help to pass it through the horse. For a horse badly affected with sand he would give a cup of kerosine and roll the animal on its back.

#### NORTH BUNDALEER.

July 18th.—Present: nine members.

**TOMATO CULTURE.**—In a short paper dealing with this subject, Mr. J. Gerke said the chief factor in the successful growing of the crop was the selection of the soil. A rich black loam with a good drainage was favored. Before planting, the soil should be worked to a depth of at least 6in., and thoroughly cultivated down to a fine tilth. For early planting he recommended Early Dwarf Red, and for late sowing Burwood's. Varieties that were subject to cracking in cold weather and sun burning during the summer months should be trained on a trellis. Early Dwarfs were only a small bush, and need only be planted 2ft. apart. Most of the other varieties should be planted at least 3ft. apart. Pruning induced the fruit to ripen a little earlier in the season, but when the crop was grown for wholesale purposes he had found that it reduced the crop. The plants should be watered immediately after planting, and at least once a day during the hot weather. When the plants had covered the ground the water could be reduced, because too much water was inclined to toughen the skin and develop hollow fruit. He did not advise the sowing of tomatoes for two successive seasons on the same piece of land, because there was a danger of the second crop being infested with disease.

**THE MOTOR TRACTOR.**—At a previous meeting of the Branch a member contributed a paper on this subject. The speaker said the point that presented itself when one considered the purchase of a tractor was whether the engine was an advantage or otherwise over horses, both as regards labor and cost. His advice to any one working a tractor was first, “never overload the engine, and, secondly, keep all the working parts well oiled and free from dirt, and when not being used the engine should be placed under cover and all water drained from the cooling system.” The speaker had worked a tractor since last May, and the following figures were the results of his experiences with the engine from that time. The acreage ploughed per day has been an average of 12 acres, with a five-furrow plough cutting 3ft. Amount of kerosine used per day is 17½galls., at 2s. 6d. per gallon, £2 3s. 9d.; lubricating oil, 1gall., 7s. 3d.; cup grease, ½lb., 3d.; one man’s wages and board, 13s.; total cost, £3 4s. 3d. per day. On the other hand, acreage ploughed with same plough and seven horses was seven acres. Chaff consumed by horses, 210lbs., valued at 10s.; crushed oats, 14lbs., 1s.; wages and board, 13s.; total cost per day, £1 4s. From the above comparison it would be noticed that while the work was performed more cheaply by the horses, the tractor did the work in nearly half the time. Putting aside the possibility of sickness among the animals, he considered the tractor a more payable investment. The engine only required feed whilst it was working, while on the other hand the horses had to be fed all the time. The approximate cost of keeping the horses, when they were not working could be reckoned at about 2s. per week, while the cost of the tractor would, of course, be nil. It should also be borne in mind that any other belt work, such as chaff cutting, sawing, pumping, &c., could be done by the tractor, which assets would considerably enhance its value. The writer stated that through the aid of the tractor he had been able to increase the area of his cultivated land by 80 acres.

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**PORT GERMEIN** (Average annual rainfall, 12.84in.).

July 2nd.—Present: seven members.

**DOCKAGE OF WHEAT.**—The Secretary (Mr. Alf. Trestrail) contributed a paper on this subject. He was of the opinion that wheat should be docked, because in many cases it was unfit for the manufacture of flour. Grain that was infested with smut was very difficult to clean, especially if the smut balls became broken, and he advised farmers to be careful in picking their wheat and also in selecting good, firm, and plump grain for seed. Foreign matter, such as barley and several of the varieties of thistle seeds, especially star thistle, were also found in wheat. He thought dockage was right if wheat was infested with those seeds. Barley and drake were the worst of the foreign seeds, and they were hard to separate from the wheat, and if they were crushed with it they would make the flour dark in color and of an inferior quality. Light grain was lacking in quality for good flour; there was also much more bran in same. If other commodities were sold according to grade, farmers should not expect the first quality price for an inferior sample of wheat. Docking would also have a tendency to encourage farmers to put a better and finer sample on the market. Damaged grain did not produce either good flour, bran, or pollard, and although perhaps a few grains might not be noticed, they lowered the standard of the product. Unripe wheat was also detrimental to a good product, and had a tendency to encourage the development of weevil. Flour from bleached wheat was not so good as flour from unbleached wheat, because it had been proved that it had about 3 per cent. less gluten. A good discussion followed the reading of the papers, members generally agreeing with the views of the writers.

**REDHILL** (Average annual rainfall, 16.79in.).

July 26th.—Present: nine members.

**BOOKKEEPING FOR FARMERS.**—The following paper was contributed by Mr. J. J. Hayes:—The business of the farmer is so varied that it is recognised by many efficient accountants as being difficult to make any of the recognised methods of bookkeeping wholly serve the different farmers of the State. So many different kinds of business are carried out on the farm, each one more or less depending on the other, that it is necessary for the man on the land to keep some account of his transactions. The system I advocate is for the farmer to purchase an ordinary cash book, which can be procured for a few shillings, and to enter therein all income on the credit side, and all expenditure on the debit side, with particulars of each sum in brackets. Every farmer has a banking account, and the pass book and heels of the cheque book can be referred to periodically, say, at the end of the month. If this is done with every cheque paid or received, every item can be accounted for, even if some years elapse before a perusal of the accounts is required, and if the person is not capable of transferring them from this account into a proper double entry form, it is a simple matter for a qualified accountant to deal with. It is necessary, of course, to occasionally balance the account, the most suitable time being the half-yearly banking periods, namely, at the end of March and September. If this period is taken, and the balance brought forward, the farmer's account will always coincide with the bank's. On referring to the credit side of the book for taxation returns, one can always find exactly what money has been received and for what particular commodity or number of stock he received it for. The debit side will tell what articles have been received for money paid away. I also think it advisable to have a working expenses account; in fact, the more accounts the farmer keeps the better he can economise. In conclusion, I urge all farmers to have some form of bookkeeping apart from the banking account. Those farmers who have children past the school-going age should give some of the accounts to the keeping of the young people. If this is done it would be practice for the children, and give them an insight into the business methods of the management of the farm.

**WHYTE-YARCOWIE** (Average annual rainfall, 13.91in.).

June 25th.—Present: six members.

Mr. McCallum read a paper, "Signs of the Times," in which he pleaded for a fuller realisation of the possibilities of home entertainment and comforts as a means of checking the drift of the rural community to the cities. In opening the

discussion, Mr. Lock was of the opinion that as far as possible city conveniences should be provided on the farm. He advocated giving the farm laborer the greatest possible consideration, and in good times would raise his wages in order to make his life more attractive. Mr. Pearce thought it was unreasonable to expect a man to come and work for the farmer for a short period, and then have to seek work elsewhere. He advocated the adoption of the half-holiday system for farmers' sons and daughters, in order to enable them to mix with their fellow-beings in the town. He expressed the hope that farmers, instead of endeavoring to make enough money to live in the city, would make their homes as attractive as possible, and live their lives on their farms. Other members agreed with Mr. McCallum.

The annual meeting was held on July 23rd, when the report of the work done during the past year was presented by the Hon. Secretary (Mr. P. McEntee), and the election of officers took place. Delegates to the Annual Congress were also appointed.

#### YACKA.

June 14th.—Present: 13 members.

ROTATION OF CROPS IN CONNECTION WITH LIVESTOCK.—The following paper was read by Mr. W. H. Richards:—It is now a well-recognised fact that, by a rotation of bare fallow, wheat, and pasture, the yield per acre will be one-third greater than is the case with a rotation of bare fallow followed by wheat. Thus 2 acres cropped every third year will produce as much as 3 acres cropped every second year. But, whilst the three-year rotation mentioned is a considerable improvement upon the bare fallow, wheat system, it does not allow of livestock being kept to the best advantage, because the farm can only be stocked to its capacity at the worst time of the year, and consequently much of the rank growth of the spring time and also much of the stubbles go to waste. Another objection is, that wheat being the only crop grown, a substantial proportion of it must be cut for hay to be fed to the working horses. Thus, the actual area of wheat left for grain will be about the same as it is in a four-year rotation, when the hay would be cut from a second crop, and all the wheat sown would be harvested for grain. Wheat is our main crop, and will probably occupy that position for ever, so that in considering second crops we must do so with a clear understanding that the production of wheat must not be lessened. I strongly recommend a four-year rotation of bare fallow, wheat, second crop, pasture. The most profitable way of disposing of the second crop is by using it as fodder for livestock. The profit of the livestock is not confined to the return from the sale of the beast, but it is also found in the increased fertility of the soil, caused by the droppings of the animals. Cattle return to the land from 10 to 12 tons of manure per head per annum, and sheep will return up to three-quarters of a ton each per annum. Therefore, if three sheep per acre are kept on the land available for pasture for a year, it will result in a dressing of about 2 tons of manure per acre. Therefore, if livestock only just pay for themselves, and deposit this manure on the land, they are worth keeping on the farm. For our conditions oats are the most suitable second crop. It is a first-class fodder either as hay or grain; it may also be used as green feed during the winter months. It should be sown before the wheat. Barley is also well worth a place in the second crop. If sown early it is better for green feed than oats, or it may be sown later than the wheat, and harvested for grain. It is an easy crop to grow, and is particularly suitable to be left till last. A wet, cold seed bed appears to be detrimental to it. A great advantage that both oats and barley have is that they grow more strongly than the weeds, and if sown in dirty land will not only come to a good crop but will greatly assist in cleaning the land. Sheep are the most suitable livestock to be kept. The area devoted to pasture should easily carry three sheep per acre, with the assistance of other portions of the farm, which will not be actually carrying crops for more than about seven months in the year, and by hand feeding, when the natural feed is not sufficient in quantity or quality, to keep the animals thriving. The most suitable method of hand feeding sheep is to scatter grain on a firm, dry piece of land, such as a grassy hillside; then they will get all of it. If chaff is used it will be necessary to have feeders erected in a spot as much out of the wind as possible. It is never advisable to feed hay to either cattle or sheep,

as they only waste the greater part of it. Some of the advantages of this system in regard to agriculture are a liberal dressing of manure, the seeding period will be greatly lengthened, each crop, oats, wheat, barley will be sown at the best time. The substantial addition of organic matter will do more to prevent the land washing into gutters than any other means at our disposal. The constant moving of the crops is the most effective method of preventing disease. The farm can be worked with less horses. The work will be spread more evenly throughout the year. In regard to livestock, the advantages are so great that they will soon be regarded as essential. If the lambs are dropped before the green feed comes they will not thrive, or if the lambing is delayed until the green feed is practically certain the weather will most likely be too wet and cold for the lambs to do well. How much better it is to have a plentiful supply of oats and barley, and to have the lambs dropped about the third week in March when the fierce heat of the summer is done, or, again, how often instead of selling wethers as forward stores at a time when the markets are rushed with such stock, a little hand feeding will enable them to be marketed as fats. Moreover, livestock farming will hold the interest of the farmer, and develop the best that is in him, as wheat growing alone will never do.

GLADSTONE, August 13th.—An interesting evening was spent in discussing several items of local importance. Messrs. J. H. Sargent and A. Blesing were appointed delegates to the forthcoming Annual Congress.

## LOWER-NORTH DISTRICT.

### (ADELAIDE TO FARRELL'S FLAT.)

#### BLACK SPRINGS.

July 19th.—Present: 21 members.

FARM TRACTORS.—In the course of a short paper dealing with this subject, Mr. K. Dunn said there were several well-constructed tractors on the market, but the difficulty, from the point of view of the farmer, seemed to be that the engines would not do all the work at present performed by the horses throughout the whole of the year, and until that could be said of the tractor he did not think they would be of any advantage to the farmer. Cost of fuel, upkeep of the engine, and the employment of extra labor were problems that presented themselves with the advent of the tractor, but notwithstanding those obstacles he believed the time would come when the farmers of Australia would employ tractors for agricultural work.

FENCING AND THE VALUE OF SMALL PADDOCKS.—A short paper on this subject was contributed by Mr. A. Burbidge. The speaker emphasised the necessity for keeping the fences of the farm in good repair. Nothing, he contended, taught young stock to become bad fencers like fences out of order. With the farm subdivided into paddocks containing about 50 acres to 100 acres each, the stock could frequently be given a change of pasture. That would not only help to keep the animals in good condition, but the grass would have a chance to make a fresh and sweet growth. He also believed the small paddocks to be better for fallowing, because one could keep the stock immediately in front of the work, and thereby make the best use of the feed. Both papers aroused a lively and interesting discussion.

### SADDLEWORTH (WOMEN'S) (Average annual rainfall, 19.69in.).

July 12th.—Present: 12 members.

FOOD VALUES.—The following paper was contributed by Mrs. R. Hastings:—Food is necessary to provide material for growth in the young, to produce heat and energy, to replace wornout tissue and muscle, to supply liquid and mineral matter to the body. The amount of food necessary depends upon the age, sex, occupation, and general health of the individual; it also varies with the amount of muscular work to be done. Our foods can be roughly classified into groups which contain one or more of the following:—Proteins, albuminoids, carbohydrates, fats, organic



acids, mineral matter, and water. Meat, wheat, sugar, and fats contain in the smallest bulk the greatest quantity of the materials that make bone and tissue and that produce energy, namely, proteins, carbohydrates, fats, and mineral matter. But meat, wheat, sugar, and fats are not the only forms of food that contain these necessary food elements. Vegetables also contain them, though to a lesser degree. The nutritive value of vegetables varies greatly. Their value is not to be judged by their weight or size. Each of these food essentials—proteins, fat, &c.—has a distinct work in our bodies:—(a) Proteins form tissue and produce heat and energy. They are necessary to life. (b) Albuminoids only produce heat and energy. (c) Carbohydrates and fats produce heat and energy. (d) Mineral matters help to form and solidify bone. (e) Organic acids purify the blood and keep the body in good health (lemons, oranges, &c.). (f) Water supplies fluid to the body, helps to dissolve our food, and aids digestion. It washes away worn-out particles of tissue. Protein forms tissue. It is, therefore, essential for building up the muscles of the body, and for repairing worn-out tissues. It is the main food element in eggs, milk, lean meat, cheese, and oatmeal and fish. Yet while steak, for instance, contains 16 per cent. protein, fresh peas have 7 per cent., and dried peas 24 per cent. of it, while Lima beans (dried) have 18 per cent., and dried lentils 25 per cent. Butter beans contain more than 20 per cent., and soy beans almost 33 per cent. pure protein. Carbohydrates are found in flour, rice, fruit, potatoes, beetroot, honey, milk, sugarcane, &c. Fats are derived from meats, butter, olive oil, and nuts. Children require a liberal allowance of fatty foods. Mineral matters are necessary to harden tissue and give it tone and vigor, and to assist digestion and purify the blood. Such salts are found in common salt, milk, fish, meat, fresh fruits and vegetables, eggs, hard water, &c. A mixed diet of plain, well-cooked food will supply all the needs of the body in health. The cheapest foods are just as nourishing and often more wholesome than the most expensive kinds. In the "good old days" people lived mainly upon beans, bacon, wheaten bread, and meal. But to know the true value of our foods is a scientific study, of which, as a study, most of us are ignorant. However, our grandmothers, and their grandmothers before them, have handed down to us a general knowledge that prevents us from serving, say, a beef-steak pudding and a roly-poly at the same meal, or a meat pie and then jam tarts, and we can always gather information from those of greater experience, as well as from books, &c. It certainly is a most interesting and a most necessary study. A paper, "The Home Beautiful," was read by Miss Hornabrook.

#### SADDLEWORTH (Average annual rainfall, 19.69in.).

July 23rd.

CARE OF DAIRY PRODUCTS.—The Chairman (Mr. J. A. Morcom) read the following paper:—In dealing with this subject I wish to confine my remarks mainly to the care of milk and cream. Cleanliness must be a matter of first importance in all dairying matters. It is rather difficult to blame the farmer for having his cowyards and bails somewhat unclean if he does not understand the necessity for a greater degree of cleanliness, but who does not know how easy it is for milk and cream to become contaminated? I will now define where it is that the presence of food for putrefactive germs is most undesirable:—(1) On the hands of the milker; (2) the cow's udder; (3) the utensils; (4) in the dairy, where the milk is separated and where the cream is kept; and (5) where the cattle stand while being milked. First take the milker. Provided the milker is the ordinary human agent, it is absolutely certain that if his or her hands are dirty the milk will be contaminated during the process of milking. If the milker is a mechanical one, and if the milking tubes or the teat cups have not been thoroughly cleaned after each milking, the milk gets contaminated at once, and in a worse way than from the agency of soiled hands. Cleanliness of the Cow.—No matter how careful the farmer may be, and how clean his dairy premises are, the coat of the cow will contain sufficient dust and small portions of organic matter to make it unwise to have those particles transferred to the bucket. While we cannot expect, nor is it necessary for, the farmer to regularly groom his milking cattle, still there is absolutely no excuse for the dairyman for not washing the udders of the cows before the process of milking begins. If the cow's udder and teats are not clean then the hands of the milker became soiled at once, and as most milkers work

with moist hands it means that dirt finds its way into the milk. **Cleanliness of Utensils.**—There is nothing which requires such a thorough condition of cleanliness in connection with dairy work as do the various utensils, because any dirt which is allowed to remain on them immediately acts as a centre from which early decomposition starts. All utensils after use should first be washed with warm water and then thoroughly scalded. It is the separator with which the careless farmer commits the greatest sin against his neighbors, and also against the factory proprietors. If the farmer fails to clean his separator after each working, it is the dirt which was in the previously separated milk which remains behind, and this is such a perfect medium for the development of putrefactive bacteria that by the time the next separation takes place there is sufficient development of germ life to immediately contaminate the cream. Cream cans also require special attention, and so long as there is any odor arising from them they are not suitable for the holding of cream. Many factories are to blame for the bad condition of cream cans, because a factory manager, through his staff, generally makes some effort toward cleaning the cans, and the farmer assumes that they do the work well; but the careful man will always take the precaution to scald his cans thoroughly before he uses them. After the cream has been separated it is allowed to remain in the dairy until arrangements are made for its dispatch to the factory, and if the dairy is not kept in a clean state the cream will absorb odors therefrom. For this reason it is necessary that the dairy should be so constructed as to be easily kept clean. Thorough ventilation should be provided, for there are few things worse than shutting up cream in a close dairy. The lids should never be put on the cans until the time of dispatch to the factory, and if covers are necessary fine muslin or cheesecloth are much preferable to a close cover, which latter only shut in the gases and excludes the pure atmosphere. **The Cow Bails.**—If the cows' bails are not clean it is impossible for the milker to do his work in a cleanly manner, and with the usual concrete or brick floored bails which are now in vogue there is absolutely no excuse for dirty conditions.

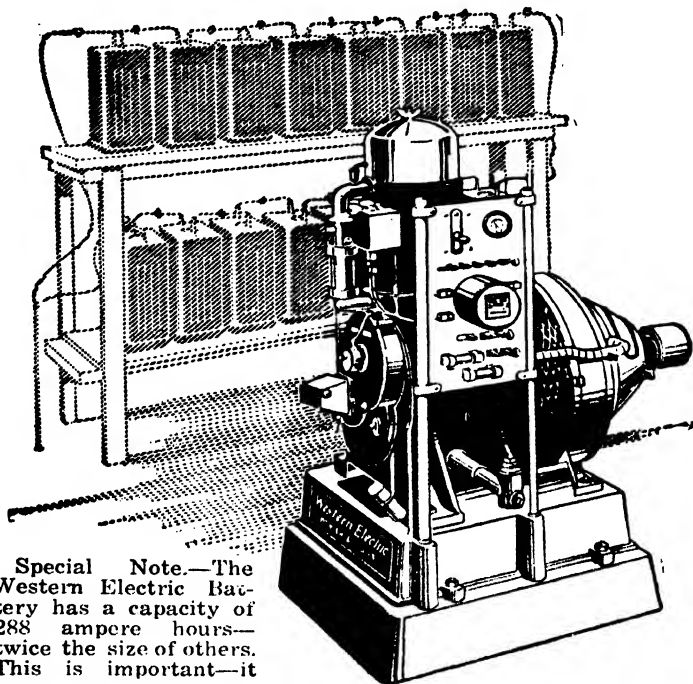
**WASTE AND NEGLECT ON THE FARM.**—In the course of a paper dealing with this subject Mr. W. G. Crawford said many farmers were at present wasting time instead of pushing ahead with the work of fallowing. Early fallow undoubtedly gave the best returns in that district, yet many agriculturists kept on putting off the work until finally the land became too hard to work. The speaker was of the opinion that many farmers undertook more work than they could possibly hope to cope with in a proper and thorough manner, with the result that some of the land did not receive the best cultivation. It was better to have 200 acres of good fallow than 300 acres of land only cultivated in a slipshod manner. As the harvest time approached, it was not uncommon for farmers to find the busy season on them, and some of the machines in need of repair. The overhauling of the implements could easily have been carried out during any of the wet days of the winter months. After harvest the cutting of straw for the roofing of the stacks should be attended to, and if a good stack of straw was made in each paddock it would prove a good investment when the cold and wet weather set in. Time should not be wasted in unnecessarily attending sales, but devoted to the working of the land. The farmer was also frequently found in the same position at seeding time as he was at harvest, in that the machines for that time of the year required attention. The seed should be pickled and ready for use in order that no time would be lost in getting the land under crop. Too many farmers neglected to attend to the work of repairing fences, and it was not uncommon for the feed in a paddock to be wasted because the division paddocks were not securely fenced off. The paper concluded, "Never put off or neglect doing anything on the farm till to-morrow what can and ought to be done to-day."

**MALLALA, July 19th.**—After the usual business in connection with the annual meeting had been transacted, an address, "The Principles of Breeding," was delivered by Mr. W. S. Kelly (Vice-Chairman of the Advisory Board of Agriculture).

**ROSEDALE, July 20th.**—An interesting and instructive address, "The Value of Hand Selecting Seed Wheat," was delivered by Mr. H. L. Twartz.

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**SALISBURY**, August 2nd.—Mr. W. J. McNicol read a paper, "Dairying in the Salisbury District," and an interesting discussion followed. The Hon. Secretary advised that further meetings of the Branch would be held on October 4th and November 1st.

**VIRGINIA**, July 13th.—The Horticultural Instructor (Mr. Geo. Quinn) attended the meeting, and delivered an address, "Pruning Fruit Trees and Vines."

**WILLIAMSTOWN (WOMEN'S)**, August 3rd.—The meeting was devoted to the compiling of a programme for the ensuing six months, and the delegates to the Annual Congress were appointed.

**WINDSOR**, August 9th.—The inaugural meeting of this Branch was held on the above date, when the Secretary of the Advisory Board of Agriculture (Mr. H. J. Finnis) attended the gathering, and delivered an address, "The Work of the Agricultural Bureau."

## YORKE PENINSULA DISTRICT.

(TO BUTE.)

### BRENTWOOD.

June 23rd.—Present: eight members and two visitors.

**QUESTION BOX.**—The meeting took the form of a "Question Box." The first subject to be considered was "The advantages of the combination drill and cultivator." Mr. Carmichael said he had found it satisfactory in both stumpy and stony ground. It worked better on a fairly firm fallow than on freshly cultivated land, and appeared to deal with weeds effectively. Mr. C. Boundy also considered it a splendid implement. It effected a great saving in horses and other ways, but the speaker thought it better to make a final working with the harrows. Not quite the same area of land could be done per day as with an ordinary drill of the same size. "What is the best quantity of super to use per acre?" A discussion took place, when it was generally considered that about 1cwt. gave the best results. "The best, quickest, and cheapest way to work a thousand-acre farm?" Several members agreed with the following statement made by Mr. C. Boundy:—"Plough back the fallow after harvest, and then the cultivator will deal with rubbish later on. Then use a combination drill and cultivator for seeding." "How long will pickled wheat retain its germinating powers?" Mr. J. Boundy said so long as the wheat was dry it could be kept for lengthy periods without injury. Mr. C. Boundy quoted cases in which he considered freeness from smut was due to pickling ahead. The seed should be allowed to drain, and provision made for a free circulation of air to dry the grain. "How many sheep can be safely kept on a 1,000-acre farm, one-third of which is cultivated every year?" Mr. Carmichael's subdivision, which members considered about the right system, was as follows:—Three hundred and fifty acres crop, 200 acres fallow, 100 acres pasture for horses, and 350 acres for 200 sheep. Mr. C. Boundy thought it inadvisable to run sheep too long in stubble, especially if one desired to burn the straw. A lengthy discussion took place on a question dealing with the erection of a butter factory. Subsequently it was decided that a paper on the subject be written by Mr. C. Boundy.

## WESTERN DISTRICT.

### BIG SWAMP.

July 14th.—Present; nine members.

**POULTRY ON THE FARM.**—It was the contention of the Hon. Secretary (Mr. J. W. Winch), who read a paper on this subject, that in such a district as theirs poultry should be a profitable side line of the farm. He believed that poultry keeping was a more congenial occupation than dairying, and that as a rule the care of the birds fell to the lot of the women folk, who looked after them considerably better than the men. Every farm had a score or so of poultry, and if

they could be made to return a profit the revenue of the farm could be increased by keeping a larger number. He thought that 200 would be a convenient number of birds to manage without employing extra help. Although theirs was not a wheat-growing district, a few acres of land could be found on every farm on which to grow sufficient grain for fowls' feed. As foxes were troublesome, it was very important to provide housing accommodation for the birds at night. He had erected wire-netting yards, 6ft. high, and with netting over the top, to protect the fowls from foxes and sparrows. Perches about 2ft. from the ground were high enough. For shelter he used tall reeds growing around swamps, both for the sides and roof; but if a more elaborate structure was desired he recommended farmers to consult the Poultry Expert of the Department of Agriculture. The White Leghorn held first place as an egg producer, but for a general utility bird he expressed a preference for the Rhode Island Red. One disadvantage of the White Leghorn was that it would not "set," and as it was important that they should have early hatches, an incubator was necessary. Most of the heavy breeds were good sitters. He recommended sending eggs to the Adelaide markets on one's own account, even though they could only be forwarded by the weekly boat. Nevertheless, if the eggs were gathered often and stored in a cool place, it would be found that they would reach the market in good condition. The annual report was presented, and the officers elected for the coming year.

BUTLER (Average annual rainfall, 16.61in.).

July 18th.—Present: 16 members and four visitors.

FENCES AND BUILDINGS.—Mr. C. F. Jericho, who contributed a short paper dealing with the above subject, considered the most serviceable fence for the farmer who kept a few cattle and sheep to be one constructed with seven wires—six plain No. 8 wires and 12 x 3 barb on the top. The outside boundary fence should be verminproof, 3ft. x 1½in. mesh netting, with a barb on top of the post, a plain No. 8 wire on the top of the netting and a No. 10 wire midway between the ground and the top of the netting. The speaker suggested 1½in. x 3-16in. T iron standards, with gum strainers set 8 chains or 10 chains apart. If flat standards were used they should be heavier, say, 1½in. or 1½in. x 5-16in., and long enough to allow about 14in. to be driven into the ground. Good sheds were of great importance. Every machine and implement should be placed in a shed when not in use, because the weather did more harm to the machines than the work they performed. In his opinion it would pay every farmer to erect a shed or a shelter for every machine he purchased. If iron buildings were too costly, a straw shed should be constructed. After the discussion, the Hon. Secretary (Mr. N. G. Stewart) read the annual report, and the election of officers took place.

COLLIE.

June 18th.

ONION GROWING.—Mr. V. G. Barnes, who contributed a paper dealing with this subject, said the early white varieties should be sown in February and March, but the main crop (those that were to be put away in storage) could be sown during July and August. The speaker believed that one of the main causes of the onions rotting whilst in the ground was the fact that they were planted too deeply. That also was a reason why some of the bulbs failed to keep for any length of time. The trouble frequently commenced in the seed bed when the grower covered the seed with too much earth, and when the young plant was taken out it had a long white neck, which, on exposure to the sun, became scorched. Experienced growers only covered the seed with a very thin layer of fine earth. The usual practice was to simply scatter the seed over the bed and press them into the soil with a flat board. When the planting-out was being performed, a small dibble should be used and each plant set in the hole, so that when pressed down firmly only the roots would be covered up. Good crops could be obtained on practically any class of well-conditioned soil, provided it had been thoroughly pulverized. In sandy soil the plants grew very rapidly and reached a large size, but as a rule the tubers would not keep for the same length of time as those grown on a stronger soil. Unless the crop previously grown had received a heavy dressing of manure and a deep digging, it was advisable to add a heavy dressing of manure and thoroughly pulverize the soil.

Onions could be grown on the same ground for two or three consecutive years, but a change of crop each year was to be preferred. The distance apart when planting should be governed by the size of the bulbs required—8in., if large, but smaller bulbs were more economical for home use, for which 4in. rows, 8in. apart, would be ample room. It was most important that the land should be kept free from weeds whilst the plants were growing. If seed heads formed they should be pinched out without delay, and fairly good bulbs would still be made. Any thick-necked plants should immediately be pulled out. The shrivelling of the necks and the withering of the leaves could be taken as signs that the bulbs were ready for harvesting. Finally, the onions should be thinly spread out in a shed for two or three weeks to dry. For keeping qualities, the speaker recommended Brown Spanish; for early crops, Extra Early White and Early Brown Spanish, and Brown Tripoli. For quick mid-season crop, the White Spanish was without an equal. An interesting discussion followed.

**PREPARING, PICKLING, AND SOWING WHEAT.**—In the course of a paper dealing with this subject, Mr. H. Shipard said great care should be taken at harvest time with the wheat that one intended saving for seed. If possible, the seed wheat should be reaped in cool weather to minimise the danger of cracking the grain. If one did not have a grader, the seed wheat should be rewinnowed prior to pickling to remove any inferior and foreign grains. He had once favored the system of pickling the wheat on a cloth or floor, but on account of the difficulty in obtaining sufficient labor to assist with the seedling operations he had resorted to the use of a large cask and lever for immersing the wheat in the pickling solution. The following was the method adopted by the speaker:—"The bag is hung on one end of the lever and placed in the cask. At the top end of the bag is fastened a hoop, just a little larger than the cask, to prevent it from falling in. It is then held there by two small hooks; the bag being in the pickle, the wheat is then poured into the pickle slowly to allow all smut balls, oats, and other rubbish to float. When the skimming is finished, the bag is lifted out of the pickle by means of the lever, and allowed to drain back into the cask. The pickled grain is then removed from the dip bag, by holding an empty bag underneath and untying it at the bottom, when all the grain will run into the other bag. Then tie the dip bag again and place it in the cask, as before, and repeat the process. In this way the seed is floated and pickled in one process and is much cheaper than buying a pickler, and I think very much quicker." The speaker also suggested that if the above method was adopted it would be advisable to have a second cask with a supply of pickle in it in order to refill the dip when it became low. He usually mixed a jam tin full of bluestone in 5gall. or 6gall. water, which proved sufficient solution to treat 16bush. of seed. A pair of hames made from mallee wood were tabled by Mr. Shipard.

#### MILTALIE (Average annual rainfall, 14.55in.).

July 13th.—Present: eight members.

**THE IMPROVEMENT OF FARM STOCK.**—"In every branch of agriculture the man on the land should aim at producing a product of the highest standard," said Mr. A. M. Wilson, in a paper on the above subject. Continuing, the speaker said many men were very particular in their selection of seed wheat and in other farming practices, yet regarding their farm stock they were apt to be very careless. The question he wished to bring forward was, "Is the average farmer doing his best for himself and for his district in the class of farm animal he breeds?" Stock-breeding and the quality of the stock bred was a matter of vital importance to every farmer. The man who was careless on that point was not only a financial loser, but was also laying up trouble for himself. As a body of mixed farmers, they were chiefly concerned with horses, cattle, and sheep. If the purchase of a well-bred sire was too expensive for the individual, they should co-operate, and secure a well-bred entire. The speaker thought the Suffolk Punch the most suitable horse for the class of work that had to be performed in that district. The type of milch cow kept on the average farm also showed great room for improvement. So long as the cow came in milk regularly, the farmer did not seem to consider the quality of her milk, nor the breed of her calf. He was glad to say that some of the farmers realised the need for improvement in the cattle, and were

importing well-bred bulls to raise the standard of the herds. Shorthorn or Holstein bulls would suit the average farmer's requirements very well, both as regards the milk supply and the quality of the beef. Another animal of great importance was the sheep, and whilst almost any breed could be used for checking the growth of weeds, &c., yet there were certain types that excelled, so that farmers would be well advised to purchase rams from well-known studs. In opening the discussion, the Hon. Secretary (Mr. W. G. Smith) said it was quite evident that there was much room for improvement in the class of sheep kept. The Merino was the most profitable sheep for that district, because there was no market for fat lambs. He would not breed the Merino too fine, as sheep for that locality needed a robust constitution. Mr. J. P. Story believed that a good stallion was needed to improve the horse stock of the district. He did not favor the Suffolk Punch, and preferred a heavier type of horse for general work. Other stock, such as cattle, pigs, and fowls, could also be improved. Mr. W. H. Wheeler did not think the horse mentioned in the paper was suitable to mate with their mares. He favored the Milking Shorthorn as a dual purpose animal, and was a firm believer in keeping the very best bred animal in any class of farm stock. Mr. C. Degner favored a heavier bred of horse than the Suffolk Punch.

#### MCLACHLAN.

July 2nd.—Present: 19 members.

**CARE OF HORSES.**—In the course of a paper under the heading, "Care of Farm Horses and Home Remedies for Common Ailments," Mr. G. Owen said every farmer should devote proper attention to the feeding and care of his horses. The animals should, at regular intervals, be fed three times a day. Wheaten hay chaff and oats made an excellent feed, and if a teaspoonful of sulphur and a handful of common salt were added to each horse's meal once a week, much would be done to keep the animals in a healthy condition. Only sufficient chaff should be placed in the manger at once as was necessary for one meal. Referring to the watering of the stock, the speaker said they should, of course, be allowed three drinks a day, and he preferred to water them before the mid-day meal, as he believed that improved their appetite. The shoulders and collars should be thoroughly brushed each morning. He preferred leather lined collars, in order that the danger of the horses' shoulders scalding might be minimised. "Remedies for Common Ailments."—The following recipes were quoted by the speaker:—For colic use linseed oil. To prepare for use, take 2 handfuls of seed in a bucket; pour over this 1½ galls. of boiling water, cover and let stand a short time; then add 2 quarts of cold water. It is ready for use. In case of an irritating cough, add to this mixture a small quantity of honey. Treatment for strangles.—Get a hot brick or a steamed bag. Pour 1 teaspoon of eucalyptus on either; put in a nosebag, and keep this on the horse until he begins to cough, then remove for a short interval, using judgment in the time the remedy is used. For horses badly scoured, take four or five rib bones of a sheep or bullock (sheep preferred), burn these to a white ash, stir with 1 pint lukewarm water, and drench; or, if the horse will eat, sprinkle the bonedust or a little bran in his chaff. For any ordinary ailments, take 2 tablespoons ground ginger, 1 teaspoon saltpetre (ground), 4 packets Epsom salts, in 1 pint of hot water. When dissolved and cool it is ready for drenching.

#### ROBERTS AND VERRAN.

July 18th.—Present: eight members and five visitors.

**CARE OF IMPLEMENTS.**—The Hon. Secretary (Mr. H. Videon) read the following paper:—"The present high prices of implements render it a matter of vital importance that we should practise strict economy in the maintenance of these articles. Neglect of implements will make a large reduction in any profits that may accrue from agricultural pursuits. Therefore, it is to every farmer's interest to stop this waste. The first step in this direction is to erect a shelter shed to protect the machinery from the elements when not in use. An overhead roof will protect implements very well during the blistering heat of the sun at mid-day and from steady, soaking rains. However, the sun does not always assume this position, nor does the rain always come straight down. A good sweeping rain will quickly show the need of walls or doors, which, to my mind, are almost as important as the

roof. When the implements have completed their various branches of work they should be immediately placed under cover. During luncheon hour, in the paddocks, it is a good idea to overhaul the machine and screw up all nuts that have worked loose. This attention pays for itself during the life of the implement by keeping the framework rigid, and allowing the bearings to do their work without wearing before their time. Frequent oiling will permit the general smooth running of all the working parts. Neglect in this quarter will be repaid by rapid destruction. A little common sense in selection of oils will prove beneficial. While a cheaper class of oil will do very well for slow-moving bearings, it leaves much to be desired in the lubrication of bearings of rapid motion. The ideal oil for this type of bearing is of a clear and adhesive quality, giving maximum service with minimum waste. On the other hand, the cheaper oils tend to corrode readily, caused by the large amount of foreign matter contained therein. Should the oil run through the bearings too quickly, a piece of wool, loosely twisted, inserted into the oil hole, will stop this by forming a sort of feed regulator. A break in parts should be immediately repaired, and worn bearings replaced. With a little ingenuity worn bearings can be made serviceable. White metal has become very popular amongst farmers for this work, and is easily worked. Every two years all implements and vehicles should receive a coat of paint. This not only preserves the wood, but has a pleasing appearance, thereby commanding a higher figure should the owner desire to sell. Carriage paint, though more expensive than ordinary paint, does excellent work, and retains its fresh appearance for a considerable period. Farm implements are very sturdy as a rule, and with reasonable care can be made to last over a great number of years." In the discussion that followed, Mr. A. T. Cowley said ignorance of machinery was, in his opinion, disastrous to the life of implements. Inattention to loose nuts and bolts was a grave mistake. The speaker then pointed out the benefits derived from shelter and painting. Mr. Cowley also gave some interesting information of the ravages of rust on iron and

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steel. Mr. Geo. Drayton said farmers were well advised to attempt to keep the standard laid down by the writer, and remarked that if proper care was taken in the selection of lubricants, bearings would have a longer period of use. Worn bearings could be made serviceable, in cases of emergency, by packing with the rind of bacon. Mr. B. Evans agreed with the writer on most points. In his opinion paint was necessary to retain the natural properties of wood. At the close of the season the implements should be overhauled, and all broken and worn parts replaced. Mr. F. Imhoff said if means were not available to erect elaborate sheds, a great deal could be done in other ways to help preserve the implements. Sand should be scraped away from the wheels of machines not in use. He found it an excellent practice to run over implements during lunch hour, and screw up all nuts that had worked loose. Mr. C. Kunst found it a good plan, if the length of bolt allowed, to use a check nut. The Hon. Secretary (Mr. H. C. Videon) then read the annual report, and the officers were elected for the ensuing year.

#### SMOKY BAY (Average annual rainfall, 13.06in.).

July 16th.—Present: seven members.

**SHEARING.**—Mr. H. W. Tremaine, who contributed a paper dealing with this subject, said sheep should be shorn in the spring, at the commencement of warm weather, but before the grass seeds began to drop. The shed should be free from draught, and provided with a boarded floor. For a small shed a couple of iron cases laid together would answer for each shearer. In the case of a farmer with large flocks of sheep, he advocated a well laid-out and permanent shed. In every shed catching pens close to the board should be erected, so that no time would be wasted by the shearer in getting the sheep. A sufficient number of hands should be engaged, so that the shearers would have nothing to do but shear. The wool picking and clearing away should, if possible, be done by other hands. It was very often difficult to secure men to shear, and in order that that might be overcome he suggested a system of co-operation among farmers. In any case, every sheep owner should, in case of emergency, be able to shear. Prior to the commencement of shearing the main flock should be grazed in a paddock handy to the shed. The morning sheep (at least) should be penned under cover the previous night, so that the wool would be quite dry and ready for an early start. A good pair of shears, with the shoulder ground down and the edge finished off with an oilstone, was essential. The shearer should be careful, and not make second cuts, but keep the shears well down on the sheep. The second cut was useless from a wool buyer's point of view, and in all probability would have a bad influence on the value of the clip. Stockholm tar should be kept handy to put on any cuts on the sheep. After each sheep had been shorn, the wool should be picked up, and the board swept, so as to prevent dirt and locks from getting into the fleece of the next sheep. As the animals were shorn, they should have their teeth examined, the loose ones extracted, and the toes cut to proper length. A learner should commence by taking off the bellies for a shearer, and gradually go a little further with the sheep, until he was able to take off the whole of the fleece.

#### YADNARIE (Average annual rainfall, 14.09in.).

July 19th.—Present: 13 members and five visitors.

**CHAFFCUTTING.**—The Hon. Secretary (Mr. J. H. Kruger) read the following paper:—The main points to be considered in making chaff of a good quality are the knives, mouth or jaws of the cutter, the driving power, and the condition of the hay. The knives should be kept well sharpened and bevelled with a steady cutting file. To do this they require to be taken off at intervals and ground down well on an emery wheel or a grindstone; the former is preferable to the latter, because the work can be done more quickly and easily than on the grindstone. It is a good plan to have a spare set of knives in case of a break, &c., or to exchange for the set in use when the same requires grinding down; this would be of special advantage in busy seasons. Next, care should be taken to see that each knife is carefully and firmly set against the jaws of the cutter. When the knives are set correctly the wheel can be pulled over comfortably with the hand. The steel plates on the bottom and sides of the cutter's mouth must be kept straight and level; and if the edges become worn they can easily be reversed or replaced by new

ones. This is most important, because the knives will not cut cleanly if the edges of the plates become worn and round; more power is also required to drive the cutter, and poorly cut chaff will be the result under such conditions. For driving the cutter an engine is preferable to horseworks, because the team can be feeding and resting while chaffing is being done. It is also quicker, and altogether more satisfactory. The extra man required to drive the horses when horseworks are used can be bringing up hay, and pay attention to the engine and chaffhouse. The driving belt should be kept tight to prevent slipping and uneven driving, and the engine should at all times have sufficient power to drive the cutter comfortably when fully supplied with hay. The hay must be in such a condition that it will not be too dusty, nor splinter the straws when being put through the cutter. If left in the stooks too long it will lose most of its nutriment. It is a good plan to apply some salt on every few layers when building the stack. A good plan to adopt is to add a quantity of salt to a bucket of water and apply with a watering can. Pure wheaten chaff is the most palatable to horses, but if cut too green is apt to make them scour. Oats, on account of their bitterness in the green stage, have to be cut when nearly ripe, and are, therefore, less easy to digest on account of absence of moisture. To get the ideal chaff I strongly advocate a mixture of one sheaf of green wheaten hay to every three sheaves of oaten hay. In the discussion that followed, Messrs. W. L. Brown and P. G. Dolling preferred the emery stone to the grindstone, and said if the work was done by competent men no harm would be done, and the knives would last a long time. Messrs. Spriggs and Laffin considered the emery stone unsuitable for the work, as knives so ground would soon get very soft, and not keep a sharp edge. Mr. Spriggs would not have the belt too tight, and favored a distance of 20ft. between the engine and cutter. Mr. P. G. Dolling suggested carting the hay in cool and damp weather, and would rather cut the hay dry than damp it with water before chaffing. The belt should not be very tight, but kept pliable with neatafoot oil. That would lessen the wear and strain on the bearings. The President (Mr. O. Forbes) advised carting hay in cool and damp weather, and he would not damp the hay, but would select a damp night, and spread the hay out the night before chaffing. He favored having a short, sharp edge on the knives, and would have the engine 15ft. away from the cutter. The speaker would not use resin on the belt; he preferred common soap. Mr. A. J. Hutchinson asked if it was not a better plan to sow wheat and oats together instead of mixing when chaffing? The Hon. Secretary (Mr. J. H. Kruger) said it would not be wise to sow wheat and oats together, because of crop disease and the uncertainty of the weather. The emery stone was much quicker than the grindstone, and would not spoil the knives. He considered it advisable to damp dry hay before chaffing.

**STRIPPER v. HARVESTER.**—A paper on this subject was contributed by Mr. H. J. Hutchinson. The following points in favor of the stripper were enumerated:—"The machine can be worked with less horsepower, and does not require a very skilled man to operate it. It will work on very rough and steep, hilly country; it takes less oil, and is very economical to work, but, of course, the cleaning up and winnowing entails a lot of extra work. The chaff is saved with the reaper, and is a very valuable fodder during a dry season. It will last twice as long as a harvester;" but, the paper continued, "where a good crop is reaped on land where there are not too many big stumps or stones, and the ground not too sandy, the harvester is the best implement." The case for the harvester was outlined as follows:—"The work is completed in one operation; only about one extra horse is required, and during unfavorable harvesting weather more wheat can be gathered. One is able to work considerably longer each day in damp weather, and, by so doing, harvesting operations are terminated much earlier. If carefully handled and well cared for, it will last for a long time when worked on fairly clear land. If the farmer wishes to save the chaff he can fix a carrier on the machine, and save most of the chaff. Finally, with the harvester, one is able to effect a considerable saving of labor." The Hon. Secretary (Mr. J. H. Kruger) also read the following short paper in support of the stripper:—"Reaping can be commenced two days earlier, as partly green grain will ripen in the heap. Less horsepower is required, and an inexperienced person can work the stripper without any fear of wasting the grain. Barely half as much oil is required, and one pinion will last three times as long, therefore enabling three times as many acres

to be harvested with the stripper. The wear and tear of the stripper is only a quarter of that of the harvester. One more acre per day can be harvested in average weather, especially in light crops and on rough ground. When the stripper is used, the grain can be carted into big heaps, and as soon as those have been fenced off the stock can be let into the paddocks to clean up the stubbles. Burning can be done early without fear of losing the stubble feed. With the harvester, bags are generally scattered all over the paddock, thus preventing stock from being turned in until all the wheat is carted, and if left unsewn for any length of time birds often waste a large amount of grain. Dirty crops reaped with the harvester need to be cleaned with the winnower to obtain a marketable sample. The sample obtained with a winnower, if a stripper is used to reap a dirty crop, is always cleaner and more satisfactory, and generally weighs better, thereby using less bags. The cocky chaff can be saved for young stock, &c., or burnt to destroy weed seeds, which a harvester would scatter over the field. Several loads of wheat are generally obtained at one heap, while with the harvester it is often necessary to shift several times to fill one load. Two hundred acres can be finished four days sooner with a 6ft. stripper than with a harvester of the same size, because a start can be made two days earlier, and two days can be gained while the reaping is being carried on. In the discussion that followed, Mr. Hier expressed the opinion the harvester was useless in a crop yielding less than 6bush. Two horses more were required to work that machine, which, he considered, was a great weed distributor. He favored a good damp-weather reaper for local conditions. Reaping should be commenced nearly a week sooner, and a start made each day just as soon as with the harvester, and the work continued quite as late in the evening. The cocky chaff could be stored for times of scarcity or burnt to destroy weeds. Mr. F. W. Jericho advised farmers to use strippers, especially on new and sandy land. The stripper, he said, was the quicker machine for taking off the crop. Mr. J. E. Quick said much depended on the conditions and requirements of each individual farmer. The harvester saved labor, and was the cheaper means of dealing with the crop. Mr. W. L. Brown favored the harvester in clean and firm land, as one would be independent of labor. He had successfully reaped a 3bush. crop with the harvester in 1914, and saved most of the chaff with a carrier attached. His harvester, although working for nine seasons, was still in good order. For sandy land the reaper was preferred, as two horses less could work that machine. Mr. P. G. Dolling preferred the harvester for a good crop. He did not think that implement scattered more weeds than the stripper. For saving grain he considered the reaper-thresher the best machine, especially in tangled crops. The President (Mr. O. Forbes) favored the stripper. With the harvester, grain was wasted in uneven crops, and two extra horses were required to operate it. Reaping could not be commenced any earlier on cool days than with the stripper. He advised farmers to stick to the stripper and the small power winnower. Mr. A. Spriggs said both were good machines, and each lost some grain, but the harvester scattered more weeds, especially the seeds of wild turnip. In cool weather, with the reaper, one could start as early and continue as late each day as with the harvester. The reaper was the quicker machine of the two, and did not take any longer to empty than the harvester.

CARROW, July 27th.—Mr. W. J. Boyce opened a discussion in reference to the Government subsidy offered for an efficient means of destroying mallee shoots. Members were of the opinion that there should be some better system for dealing with the mallee than that at present in vogue. The Hon. Secretary (Mr. T. J. Anear) presented the annual report, and the officers were elected for the ensuing term.

CLEVE, July 21st.—Mr. Hamilton read a paper, "Gambling with Science." Business in connection with the annual meeting was then transacted. The Hon. Secretary (Mr. A. Quinnell) presented the annual report, and the officers were elected for the ensuing year.

McLACHLAN, July 30th.—Several items of local interest were brought forward for discussion. An excellent sample of home-cured pork was exhibited by Mr. Bailey. Messrs. W. Hawke and J. Hayman were appointed delegates to the Annual Congress.

**TALIA**, July 16th.—The Chairman (Mr. P. A. Thomson), in a very able address, spoke of the "Advantages to be Derived from the Agricultural Bureau," and urged members to take a keener interest in the work of the Branch. The subjects, "Destruction of Weeds" and "Wheat Pickling" were also brought before the meeting.

**YALLUNDA**, July 25th.—A pruning demonstration was given by Mr. S. C. Fairbrother at his orchard on the above date. Peach, apple, plum, apricot, and pear trees and vines were operated upon, and a keen discussion on the methods adopted took place. The visitors and members were entertained at afternoon tea by Mrs. Fairbrother, and a hearty vote of thanks was accorded the host and hostess.

**YEELANNA**, July 16th.—Mr. J. H. Wagner contributed a paper "Colt Breaking." Various matters, including "Noxious Weeds," and subjects for discussion at the forthcoming Annual Congress, were also brought before the meeting. The annual report was presented by the Hon. Secretary (Mr. W. D. Wemyss), and the officers were appointed for the ensuing term.

## EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES)

**COONALPYN** (Average annual rainfall, 17.49in.).

July 15th.—Present: seven members and visitors.

**FARM MANAGEMENT**.—A discussion took place on the subject, "Managing a Farm Single-handed." Mr. Wall thought that it was not profitable at the present time to employ outside assistance during the pioneer work of the farm. The returns in the first years would not permit of that being done, and much of the employed labor was unsatisfactory. Even on a scrub block he thought it possible for a man to get along without help, especially if he had the assistance and

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encouragement of a good wife. To manage the block successfully the farmer should not carry too many sidelines, and time would be saved by laying out the sheds, &c., in a manner conducive to labor saving. The pioneer should not attempt to clear and crop too much at the start. He should grub a small area, and aim at ploughing all the partially cleared land every year. A big team would be a disadvantage to the single-handed man. He would certainly use a harvester in preference to the stripper. As much cash as possible should be turned in by marketing stumps, but in doing that the more important work of cultivation should be given precedence. A well-trained dog would be a great assistance to a man working single-handed. Mr. Pitman agreed that in the early days of clearing operations a scrub farmer could not afford to hire very much help. Marketing the stumps would be an essential to success. Mr. Gurner agreed that a man working on his own should not keep too many horses, but use a small, strong team, and to prevent loss of time have things arranged as conveniently as possible. Mr. Sleep said it first had to be decided whether the employed labor would return sufficient income to make it profitable. The Hon. Secretary (Mr. F. Tregenza) said he would not think of undertaking a scrub farm proposition on his own. It needed two men, or at least a lad, to assist with the work. Where a fair number of stock were kept it was impossible to manage alone. A paper on "Fallowing" was read by Mr. Cavanagh, and an interesting discussion followed.

#### PARILLA WELL. (Average annual rainfall, 16in. to 17in.).

July 18th.—Present: 14 members and two visitors.

CEMENTING GALVANIZED TANKS.—After the annual election of officers had taken place, Mr. J. W. Johnston contributed a paper on this subject. Tanks that were past repair, so far as the tinsmith was concerned, could be treated with cement. In a 2,000gall. tank, which had rusted through about 9in. from the top, he riveted a piece of iron over a hole about 24in. long by 9in. wide, and then cement washed the inside. Wire netting was then put on the outside and given two coats of cement. Another tank of 8,000galls. capacity was rusted through a few inches from the bottom. He cement washed it inside, netted it with 1½in. netting, and then bound it with strong pig netting and gave it a thick coat of cement. He thought the first wash should consist of pure cement, sprinkled with coarse sand and water; the next coat should consist of two parts of sand to one of cement, leaving it very rough for the final coat to stick. The last coating should consist of one and a half parts of sand to one of cement, worked to a smooth surface. Cement should be placed over the bottom to a depth of 1in. Horse troughs that were beginning to rust could also be given a thick coating of cement wash. A good discussion followed the reading of the paper.

#### POMPOOTA.

June 29th.—Present: 11 members.

INTERNAL COMBUSTION ENGINES.—Mr. L. Champness, who read a paper on this subject, said he intended to deal with the stationary type of engine, because it was the one chiefly favored by the man on the land. The paper then read as follows:—Fuel Economy.—Owing to benzine becoming prohibitive in price, I recommend an engine running on kerosine, or even crude oil, especially where constant work and a considerable amount of power is required. Ignition in starting may be by magneto or lamp, each of which has its advantages, both in initial cost and economy of fuel consumption. The magneto starting engine costs more in the first place, although the plant may be run after starting on the same fuel as a lamp-starting engine. Initial Cost.—The lamp-starting engine is usually a cheaper machine per horsepower to purchase and operate; firstly, there is an absence of component parts, and secondly, that although a larger machine, the momentum required is attained and more easily maintained, it therefore requires less fuel to operate. For the person who requires an engine that will drive a milking machine, separator, chaffcutter, wood bench, corn grinder, thrasher, &c., I would advise a lamp-ignition engine of at least six horsepower, for although four horsepower would do each and every work as required, a reserve in power is economy in fuel consumption, as it enables the engine to carry its load with ease. If the engine is required for a milking machine and separator only, I would advise a four horsepower magneto-starting plant, because when the cows are in the bails no

time is to be lost, and as only a small power is required to drive the pulsators at a high speed, fuel consumption is small, for there is practically no variation in the load, such as when chaffcutting, &c. Two and Four Cycle Types of Engines.—I should strongly advise the four-cycle type. The two-cycle, although simple in construction, cheap to manufacture, and light in weight per horsepower developed, has the disadvantages of lack of simple control and high fuel costs. The four-cycle is simple and more easily controlled, even though more operating parts are used than in the two-cycle. The extra parts are mechanically used to dispense with fuel unless the charge is required, whereas in the two-cycle engine the fuel would still be used, and pass away in smoke. Difficulty in Starting.—Spark plug defections: Clean the points. Dirt, oil, or water on points, and oil or dirt inside plug: Clean the plug if it can easily be taken to pieces; if not, fill it with benzine, and then mop out with waste. If the points are touching, open them out slightly. Should there be too much space between points, close to the thickness of a visiting card. Broken plugs should be replaced with new ones. If cable is not connected or broken, connect up, and if broken replace with new wiring. If the magneto needs retiming, see instructions supplied with engine. Inferior benzine: Clean out the tank and put in a fresh supply. See that only benzine is used in the priming can. If too much air is turned on, regulate accordingly. Engine Stops after Starting.—This is sometimes due to the fuel adjuster being closed, and no fuel in the carburetter. Turn on the taps at the tank, and if the fuel adjuster is blocked and dirty, take it to pieces and clean it with kerosine. If too much or too little air is admitted, adjust until corrected. Engine Failing to Speed Up.—This may be because the governor has not been adjusted, or perhaps it has become worn or been tampered with. Adjust the fuel and air feeds until the engine responds to the mixture. If the exhaust ports are blocked, clean them out. If the engine is giving off loud reports at the exhaust, it is because the mixture is too weak; give a little more fuel. Faulty ignition may be due to broken plugs or loose points; adjust as previously explained. Also see that the magneto points are thoroughly clean. If the engine is overheated it is possible that the water has not been turned on, or because there is not sufficient water in the tank. See that the water feed is properly adjusted, and always have sufficient in the tank. The water pipe connections occasionally become blocked with sediment, so that these should also be examined. The piston heads should be removed and cleaned from time to time. Engine Bolting.—Adjust the governor, and see if crank case packing is required to prevent any leakage. Thick clouds of smoke from exhaust can be regarded as a sign that the carburetter is flooding. Clean out the carburetter, and see that nothing is checking the float from working. Also try cutting down the fuel and giving a little more air. It also may be that the engine is too cold, in which case it should be heated up or worked longer on benzine. When the engine pulls up suddenly, and the flywheels are hard to move, the piston rings may have been broken, or because one is working with wrong cylinder oil, thereby causing the cylinder walls to become coated with carbon. Disassemble the cylinder, and clean the piston and rings thoroughly. If a hissing sound arises from the engine, the compression cock should be tightened, the packing examined, and the drain plug closed. If the asbestos or copper rings have been blown out of the compression chamber, they should be replaced with new ones. Leaking past the cylinder head indicates that one should use thicker cylinder oil, or that the compression rings are worn, and want replacing. A flooding carburetter bowl may be due to the fact that there is dirt in the float valve. If the float itself is leaking, have it repaired. Pounding or Knocking.—This is possibly caused by pre-ignition, bad timing, or the looseness of some part of the engine. All that one can do is to find the cause, and adjust. Backfiring is sometimes caused by the mixture being too weak, in the event of which a little more fuel should be added. It also might be that the spark is still burning when the charge is admitted to the cylinder, so that one should correct the timing. The paper concluded by enumerating a number of mistakes that should be avoided in the starting, running, and lubricating of the engine.

On July 6th the meeting was devoted to a discussion dealing with the precautions that should be taken by landholders to prevent the spread of contagious disease after its presence was known in a settlement.

At a further meeting, held on July 27th, Mr. L. Champness gave an interesting address, "Laying Out Farm Machinery." The speaker illustrated his remarks by blackboard drawings, and replied to a number of questions.

## TAPLAN.

July 23rd.—Present: nine members.

**HOW TO MAKE FARM LIFE ATTRACTIVE.**—A paper on this subject was contributed by Mr. B. Schier. The writer emphasized the importance of keeping farm hands on the land, and as an inducement suggested that farmers should give their employees a share of the crop each season, if work could be found for them all the year round. Mr. W. Hammond did not favor the idea of a share of the crops to employees. He agreed that labor was one of the greatest obstacles at present in the way of the farmer. Mr. G. Vogelsang could not agree with the idea of giving a share of the crop to employees. The Hon. Secretary (Mr. P. Hodge) advocated planting trees about and around the homestead, and giving all possible conveniences to the women in the home. In that way, farm life could be made much more attractive. The men should be provided with quarters as comfortable as possible, and every inducement given to a good man when he was secured.

**ALAWOONA, July 25th.**—Mr. S. Finey read a paper, "The Proposed Murray Port," and a lengthy and interesting discussion followed.

**BRINKLEY, August 13th.**—The meeting was devoted to the election of officers and the arrangement of a programme of meetings for the ensuing three months.

**COOMANDOOK, July 28th.**—Matters in connection with the interstate road were brought forward for discussion. The question of reviving interest in the Branch was also considered. Members pledged themselves to do all in their power to awaken a keener spirit in the work of the Bureau.

**GLOSSOP, July 20th.**—The Manager of the Berri Experimental Orchard (Mr. C. G. Savage) attended the meeting and delivered an address, "Fungoid Diseases and Orchard Pests."

**LONE GUM, July 20th.**—Mr. H. S. Taylor (a member of the Renmark Branch) delivered an address, "Cotton Growing." An interesting discussion followed, and Mr. Taylor replied to numerous questions.

**MONARTO SOUTH, July 16th.**—Mr. E. Leishman read a paper, "Farmers Consigning Goods on Railways." The speaker thought that every farmer should be in possession of the Goods Rates Book published by the South Australian Railways, and make himself conversant with the conditions of carriage, classes of goods, and all information appertaining to demurrage and storage. The speaker at the conclusion of the paper satisfactorily replied to a large number of questions.

**WYNARKA, July 23rd.**—Mr. Richardson read an article dealing with service of mares, which threw discredit on the practice of trying mares on the ninth day after service. Members generally were of opinion that the ninth day was the right interval on which to serve the mares.

**YOUNGHUSBAND, July 14th.**—Mr. E. Leishman, of the Horticultural Staff of the Department of Agriculture, visited the Branch, and delivered a lecture on "Pruning." On the following day a pruning demonstration was given in Mr. Brinsley's orchard.

## SOUTH AND HILLS DISTRICT.

**LONGWOOD** (Average annual rainfall, 37in. to 38in.).

June 18th.—Present: seven members and two visitors.

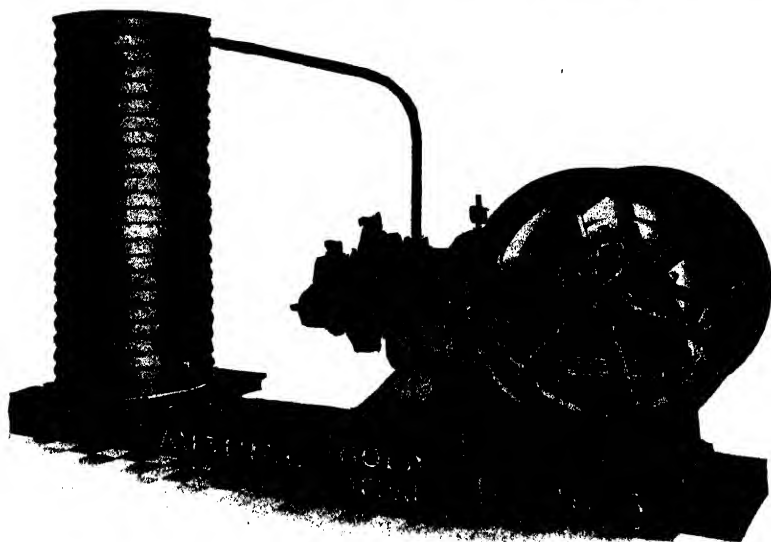
**HOMESTEAD MEETING.**—The monthly meeting of the Branch was held at the residence of Mr. W. H. Hughes. Mr. W. Hughes contributed a paper on "What to Grow to Sell." Cows, in conjunction with pigs, he said, could be profitably kept in that district. Vegetables could also be grown to perfection. He advised members to make jam from the surplus fruit. During the past 10 seasons his daughters had made 88,408lbs. of jams and jellies—excluding that which was used in the home—representing £2,242 1s. 6d., at a cost of £1,294 11s. 10d., or nearly £100 per year for the last 10 years, excluding 1921. This season, commencing early in December, and up till the end of May, 7,231lbs. of jam had been sold for £273 7s. 10d. the outlay being £196 4s. 10d. The stock in hand was valued at £161 10s.

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**MEADOWS (Average annual rainfall, 35.52in.).**

July 20th.—Present: 11 members.

**LIME FOR THE HILLS DISTRICT.**—The following paper was read by Mr. F. Vickery:—The fact that local farmers generally have been so successful in their use of superphosphate as a dressing for their crops is indirect evidence that our soils have been well endowed by Nature with lime. We still have, however, large tracts of land which lack lime, and to these sooner or later we must bring lime if we have in view healthy plant life and healthy livestock development. Apart from forming a very essential part of the structure of plants and animals, lime plays many useful roles in the development and maintenance of soil fertility. It sweetens soils and promotes healthy bacterial growth, which is so essential to good crop returns. It reacts upon the stock of plant food in the soil, and helps to render it available to plant roots. It modifies favorably the mechanical condition of both heavy and light soils. In brief, lime is indispensable to animal and plant life alike, and if insufficiently present in any soil, must be added artificially. The bulk of our South-Eastern country is lacking in lime, and the same can be said of our hills country. There are doubtless other parts similarly lacking, and in this way strong sorrel growth is an infallible indication that the soil is simply crying out for lime. In the first place, it is perhaps as well to recall that lime is a substance constantly entering into solution in water and passing, therefore, from the surface layers into the subsoil, and thence into the general country drainage. This will serve to explain why soils of districts long exposed to heavy rainfall conditions are so frequently deficient in lime. Originally they may have been quite adequately stocked with lime, but a prolonged period of heavy rainfall has gradually succeeded in leaching it out of them. It follows, therefore, that one dressing of lime, however heavy, cannot be expected to be permanently effective. According to the nature of the soil and the leaching power of local rains, it should be repeated every four or five years. Similarly as in daily practice, lime is required to act on the surface layers more even than on the subsoil, as in any case rains will, in the course of time, wash it down into the subsoil. Lime should, therefore, in the first instance, be used as a top dressing, and lightly harrowed in, and not ploughed under. Hitherto in what has been said I have had burnt lime mainly in view. It is the most active form of lime that can be used, and is always dependable. I do not wish to imply, however, that crushed limestone or carbonate of lime is not likely to prove equally effective. It is all a matter of cost, and the degree of fineness to which the limestone can be reduced. In the first place, weight for weight, crushed carbonate of lime has only one-half the effectiveness of quicklime, and it follows that it can be recommended as an adequate substitute only if used at double rates, and purchased at not more than half the cost of quicklime per ton. Secondly, crushed carbonate of lime is of very little value unless reduced to a powder quite free from any grittiness. If these two conditions are satisfactory, crushed limestone or carbonate of lime can be used in place of quicklime, and as effectively, particularly in districts subject to heavy rainfall. I recognise that liming is a costly process, but, unfortunately, it is one which cannot very well be avoided, and which ultimately makes ample repayment for any cost which may be incurred. In the discussion that followed, Mr. Nicolle said he had dressed land with lime, and had seen the results 10 years after application. Mr. Smith considered that the land should be dressed annually with lime to be effective on plant life. Mr. Durward said land that was constantly being cultivated required heavy dressings of lime, as the incessant rains were constantly washing it out. Mr. Ellis said that burnt limestone was more effective than either crushed limestone or burnt marble stone.

**MORPHETT VALE (Average annual rainfall, 23.32in.).**

July 19th.—Present: 10 members and visitors.

**REMEDIES FOR AILMENTS OF THE HORSE.**—Mr. Bladen, in the course of a short talk on this subject, said the most usual ailments of the horse a farmer had to deal with were colic and stoppage of urine. The former was often caused by an over-fatigued horse being supplied with a liberal ration of food, containing, probably, a good deal of grain. When the animal was in an exhausted condition the digestive system was unable to cope with the food, and trouble resulted. Rather

than give a heavy dose of salts, which was often done, he recommended a good dose of raw linseed oil and a little turpentine, a supply of which the farmer should always keep on hand. Stoppage of water, the symptoms of which were explained and easily recognised, was sometimes caused by hard dung constricting the passage, and sometimes by a dirty condition of the sheath and penis, which should be well washed. In the case of a mare, relief could be given by passing in the hand and pressing the valve, and thus releasing the imprisoned water. In horses a catheter had often to be used. Nitre was a good medicine to use for stoppage. In reply to a question, the speaker said it was better to allow horses to drink in moderation before eating.

**MOUNT BARKER** (Average annual rainfall, 30.93in.).

July 20th.—Present: 49 members.

**POTATO CULTURE.**—Mr. J. Pope read the following paper:—"The potato is one of the most used vegetables, and very often its cultivation is one of the most abused; but with proper attention and cultivation it can be made a most profitable crop to grow. This paper applies to summer planting from the second week in December to the first week in January, as we have proved this crop to be the most profitable for this district. Without irrigation, we favor the Snowflake, as this variety will wait for autumn rains if summer is dry. Selection of Soil.—This is important, as potatoes will grow on most soils in this district in some seasons, but to be on the safe side a good selection of soils will need to be made to avoid failures. After years of experience, we find a good loamy soil, with a good red clay subsoil, on a gentle slope, with good drainage, the most reliable selection and site. We have grown on this class of soil up to 12 tons per acre, but this season averaging 8 tons. On plots for a rotation of crops for the past four years we have averaged 6½ tons per acre; 1918, 5 tons, at £30; 1919, 7 tons, at £80; 1920, 6 tons, at £60; 1921, 8 tons, at £40, averaging £50; 1919 and 1920 were very dry summers, thus proving this class of soil to be reliable

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any season. A good dark soil, with a slatey subsoil, not too shallow, is also suitable. Preparation of Soil.—It is necessary to plough deeply early in August or early in September so as to be able to conserve the most moisture in the subsoil. Then keep the surface well worked with cultivator and harrows, drilling in a manure about October; then plough again in November, in cool weather, or after rain. Conservation of moisture plays an important part. Keep the soil well worked with harrows and cultivator, after rain, till planting time. Manuring.—Potatoes need the soil in good heart. Planting on worn-out soil means failure. The most profitable method we have found is to grow a pea crop the preceding year, and use 6cwt. to 8cwt. of super per acre. Don't be afraid to put on the manure. We have found that 8cwt. of super following peas is equal to farmyard manure, and not so expensive. Care and Selection of Seed.—Seed is one of the most important points in the successful cultivation of crop. Better to have a poor soil and good seed than poor seed and good soil. It pays to grow a stud plot from selected seed for the following crop. Medium round seed is best for summer planting. Select and lay out thinly in a shady place to green about September. Turn the seed over occasionally to prevent it from taking root. Immature seed gives best results. Planting.—We have found the best way to secure an even crop is to plough the land and plant by hand; it takes a little more time, but pays for the extra trouble. Give plenty of room between the rows and sets; rows 3ft. apart, and sets, 2ft. apart. Many a crop is spoilt by planting too close. Close planting gives plenty of potatoes, but no size, and the expense is greater and the results less; and plant 4in. to 5in. deep, well into the moisture. Keep the land harrowed close to the plough, so as to conserve moisture. As a rule the land being well worked, requires little cultivation afterwards. Cultivate after rain in the early stages of growth. Time to Dig.—If not cut with frosts before, the plants can be dug when the tops turn yellow. If the weather is dry, and if dug before the tops go down, they are not so liable to be attacked by the grubs. The moths leave the tops and get on to the potatoes. Do not leave potatoes on the ground over night on account of frosts. Cover all bags overnight with tops, but sow up as soon as possible. Notwithstanding disease and pests, under these conditions we have always had payable results, and that is what every farmer wants." Messrs. Pope Bros. and Mr. Springbett had on view splendid samples of potatoes, some of the largest ever exhibited before the Branch.

NARRUNG (Average annual rainfall, 17in. to 18in.)

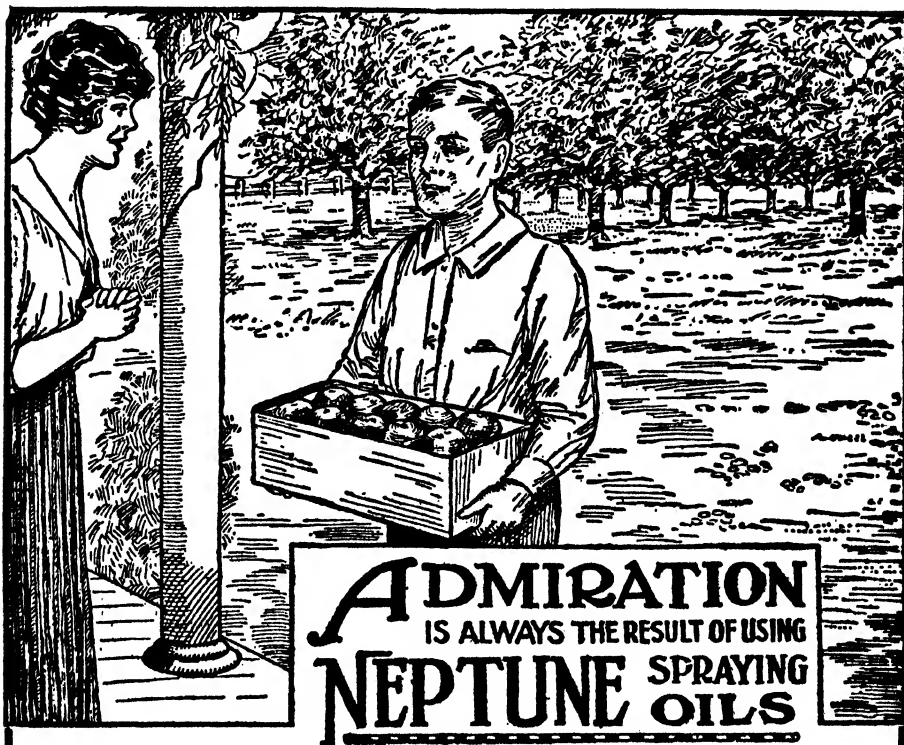
July 22nd.—Present: 27 members and visitors.

ANNUAL MEETING.—The Hon. Secretary (Mr. W. T. Lawrie) presented the annual report, which showed that during the past 12 months 10 meetings had been held, with an average attendance of 14 members. Quite a feature of the year's work was a working bee that was conducted at Mr. McInnes's farm on June 9th. Through illness Mr. McInnes had been unable to perform his work in connection with seeding operations, and the members of the Branch were responsible for the undermentioned kindly action and fine performance:—60 horses drawing 48 furrows were employed, and the day's work resulted in the ploughing of 40 acres, a portion of which was harrowed and drilled. The election of officers then took place.

#### ROCKWOOD.

July 18th.—Present: 21 members.

SHEEP AND WOOL.—"Every farmer who keeps sheep should give them the same attention as the horses and cattle," said Mr. J. H. Simmons in a paper on the above subject. Farmers in that district were exceptionally fortunate, in that climatic conditions and feed were very suitable for the keeping of sheep. The sheep best suited for their district were the English breeds and the crossbreds. He favored a ewe from the first cross between a Merino and a Lincoln or Leicester, and then brought back by the Merino ram. If breeding lambs for market, he would cross the comeback ewe with a Shropshire ram. The lambs were good doers, and able to withstand hardship, but during the lambing season one should be prepared to pay close attention to the ewes. He urged on farmers the importance of introducing rams from approved flocks into their herds, and even though



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the initial outlay in the purchase of a good sire might seem expensive, the sales from the progeny would more than cover the purchase of the ram. The majority of farmers who carried a small flock of sheep did not, he thought, pay sufficient attention to the care of the wool. After the wool was taken from the sheep it should be thrown upon the table and skirted in such a manner as to leave a fleece with a clean and bright appearance. The fleeces should be made into at least two classes—AA and A, the same practice being adopted with the pieces. Many farmers held the view that when one only had a small clip to deal with it did not pay to class the fleeces. That was a fallacy. The buyers would pay just as much attention to a small parcel of well-classed wool as they would to a clip containing a large number of bales. In the discussion that followed Mr. A. E. Henley mentioned that he had obtained good returns from both Shropshire and Border Leicester rams. Mr. Carter held the opinion that a Shropshire-cross lamb was the best for the export market. Messrs. Meyer and B. Henley agreed as to the advisability of classing the clip. Mr. Hudson expressed a preference for the Dorset Horn crossbred lambs. The Shropshire-ram-Merino-ewe cross was favored by Mr. Collett.

**THE POULTRY INDUSTRY.**—In the course of a paper dealing with this subject Mr. L. Heath said poultry keeping was a sideline of the farm which deserved more attention than was given by the majority of farmers. One of the most important points in the successful keeping of the birds was the rigid culling of the pens after they had been kept for two years. He believed that no one need fear any loss from a moderate outlay if proper methods were undertaken to secure economic working and proper management. Different people expressed a preference for different breeds, but his contention was that the White Leghorn stood on a pinnacle by itself as an egg producer. Even after two years' service as layers, the birds could be sold in the market and bring up to 3s. per head. The White Leghorns were a healthy breed of fowls, very energetic, and continually scratching about, and he realised that on that account many people did not think them an acquisition to the farm. As the Leghorns were "non-setters" it was desirable to keep a few birds of the heavy breeds on the holding for hatching the chicks. He did not favor the incubator, and believed that the chicks were more healthy and stronger when hatched in the natural way. When the hen became "broody" she should be set on from 12 to 15 eggs according to her size, and placed in a nest where she would be undisturbed by the other fowls. When the chicks commenced to hatch it was a good plan to gently lift the hen from off the eggs and remove all broken shells. The chickens would not require any food for the first 24 hours. The next day they should be given crumbs of bread that had been slightly moistened with milk. The mother and chicks should be placed under a coop, and after a few days breadcrumbs and very finely cut pieces of meat could be fed to them. An occasional feed of cut green feed would also prove beneficial. A vessel of clean drinking water should be provided, but it should be so placed that the young chicks could not get their feet into the water. After about six weeks the chicks should be able to look after themselves. If the chicks were motherless, the speaker suggested the provision of a long box, with strips of some woollen material hung from the inside of the top. Until the chicks were sufficiently advanced to make proper use of the perches, clean straw should be laid down. That would prevent their breast bones from becoming crooked when they rested on the ground. As soon as one was able to distinguish the sexes the cockerels should be separated and put in a place by themselves. If the fowls were allowed to run about, the speaker thought they only required a morning and evening meal of clean wheat. When kept in an enclosure the birds should have for the morning feed poultry meal or pollard moistened with hot water and mixed with the scraps from the house. Before the mid-day meal a small handful of corn could be scattered in the litter, in order that they would have a chance to exercise themselves by looking and scratching for the grain. Green feed could be given an hour or so later, and in the evening good sound grain should be supplied. During the laying season the fowls should not be allowed to gorge themselves, or they would become too fat, and the production of eggs would decrease. A teaspoonful of sulphate of iron placed in the drinking water occasionally would assist in keeping the birds in good health. Dry and well-crushed bones also made

an excellent food. Mr. Meyer, in opening the discussion, said the Leghorns were undoubtedly the best layers, but they did a lot of damage to the haystacks. He favored the use of an incubator. Mr. Dunn said poultry were a good paying side line for the farm. After two years' work the birds should be sent to the market. He favored the Black Orpington. Mr. Carter said the heavier breeds brought a higher price in the market than the Leghorns, but they were not so profitable for the production of eggs. The farmers should pay more attention to the gathering of the eggs. Mr. Steed had found that the Leghorns were not able to stand the cold weather that was experienced on the swamps. He preferred the Black Orpingtons. Mr. Werry said August and September were the best months for hatching, and thought crushed grain was the best food for chickens. Mr. Collett favored keeping a flock of pure-bred White Leghorns. Mr. Hodson had a number of Rhode Island Reds that had proved excellent table birds and good winter layers.

**CHERRY GARDENS, August 16th.**—The Secretary of the Advisory Board of Agriculture (Mr. H. J. Finnis) attended the meeting and delivered an address, "The Work of the Agricultural Bureau." The Field Officer of the Department of Agriculture (Mr. J. Opie) was also present, and gave a short talk on "Tobacco Culture."

**HARTLEY.**—The following programme of meetings has been received from the Secretary of the above Branch (Mr. B. Hudd):—September 14th—Social and business; October 5th—Papers, Messrs. J. M. Hudd, E. Jenkins, and P. Paech; November 9th—Papers, Messrs. J. Stanton, H. Cross, and B. Jaensch; December 14th—Papers, Messrs. H. Stanton, D. Clark, and D. Freestun.




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**IRONBANK, July 23rd.**—An interesting and instructive evening was devoted to a discussion of the subject, "Fruit Drying." The matter of the erection of a drying plant was also brought before the meeting, and, provided the cost of the building was within the scope of the local growers, it was their intention to have a plant installed for the next season.

**MILANG.**—The following is the programme of meetings compiled by the above Branch for the year ending July, 1922:—October 8th—"Question Box," all members; November 12th—Debate, "Stripper v. Harvester," leaders, W. L. Williams and Jas. P. Bagley; December 10th—Paper, "How to Improve the Town and District," Mr. A. Willington; 1922.—January 14th—Paper, "Employment of Idle Moments," Mr. W. S. Yelland; February 11th—Paper, "Advantages of Being a Member of an Agricultural Bureau, Mr. L. H. Moar; March 11th—Paper, "Stock Raising on the Farm," Mr. J. W. Yelland; April 8th—Paper, "Can Continuous Cropping be Recommended," Mr. M. McBain; May 13th—Paper, "Have Dairy Cows Deteriorated?" Mr. Jas. Jarvis; June 10th—Paper, "Laying Out a Farm Homestead," Mr. W. Perry; July 8th—Secretary's report and election of officers, &c.

**MOUNT BARKER.**—The following is the programme of meetings of the above Branch for the year ending July 5th, 1922:—September 14th—Paper, "Organisation on the Farm," Mr. W. Henderson; October 11th—Lecture, "Reinforced Concrete Tanks," Mr. J. Paull; November 9th—Demonstration on "Testing," Mr. Suter (Dairy Expert); December 14th—Paper, "Bees for Profit," Mr. E. Stevens; January 11th, 1922—Lecture, "The Wonders of Bird Life and their Use to Man," Mr. E. Ashby; February 8th—Lecture, "The Rotation of Crops Experiments," Mr. W. J. Spafford (Superintendent Experimental Works); March 8th—Paper, "Subterranean Clover," Mr. A. Howard; April 12th—"Harvest Home"; May 10th—Paper, "Pruning of Apple Trees," Mr. S. Grivell; June 7th—Paper, "The Rearing of Calves," Mr. Cowan, B.Sc. (Agric.); July 5th—Paper, "Tuberculosis in Cattle," Mr. P. Wise (annual meeting).

**MOUNT PLEASANT, August 12th.**—Mr. Giles spoke very strongly against boxthorn, Salvation Jane, and stinkwort as noxious plants, and also on the destruction of rabbits and foxes. He thought all of those pests could be destroyed if taken in hand thoroughly. Mr. Tapscott spoke in favor of Salvation Jane as being suitable for hay. Mr. Maxwell thought it impossible to eradicate stinkwort on cultivated land.

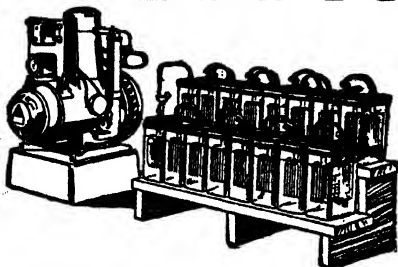
## SOUTH-EAST DISTRICT.

### MOORAK.

June 17th.—Present: 17 members.

**CARE AND ATTENTION OF FRUIT TREES.**—Mr. H. H. Orchard (Orchard Instructor for the South-East) read the following paper:—"Many of the homes on Moorak are surrounded or sheltered by fruit trees, and appearances generally are indicative of attention being given to them. An old motto has it, 'If a thing is worth doing it is worth doing well;' and 'if fruit trees are worth growing they are worth growing well.' Pruning, systematically and regularly carried out each year, is essential to the longevity of a fruit tree. An unpruned tree makes strong growth for a few years, then the amount of new wood produced gradually lessens, until finally the tree becomes practically stationary. The fruits, too, are produced higher up each year, leaving the lower portions bare. Through these useless portions the sap has to flow to reach the producing parts, and the greater the distance the sap has to cover, the weaker these parts will be. Pruning is practised to overcome these faults by having the arms all well covered with fruit-bearing wood, and each year to produce good healthy growth. The operation, therefore, has for its aims:—To ensure a regular crop of good quality fruit over a long period, and to facilitate harvesting. Winter is the best time to carry out the operation. The trees are devoid of foliage, and the position and relative value of

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the various parts are easily discerned. Pruning in the dormant period stimulates a strong growth when the season of activity comes round again. Summer pruning is carried out whilst the trees are in active growth. As plants breathe through the pores of the leaves, it follows that if any of the green leaf surface is suddenly removed, the tree must receive a check more or less severe, according to the quantity removed. Summer pruning is useful in temporarily checking a vigorous shoot. For the development of lateral fruit shoots it is practised, but to be successful the operation must be performed after mid summer, when the sap flow is subsiding. The buds are then supplied without forcing them into active growth. The pruning of young fruit trees is absolutely essential. A solid foundation and framework must be built up, upon which the fruit-bearing branches are supported later on. It is almost impossible to attempt to shape a tree after a few years' neglect. If this initial work is neglected, then constant trouble can be expected. The additional weight consequent on the formation of fruit cannot be borne, and arms will crack and break. The wind, too, has a better opportunity to play havoc. Cracked and broken arms at once act as a good harbor for disease. A tree consists of a stem or trunk, main arms, secondary arms, annual shoots. The length of the stem varies, but consistent with good cultivation the shorter it is the less leverage has the wind got. The main arms are really the foundations of the tree, and are short, well formed, and well spaced round the stem. They are usually three to five in number, and for best results should not spring from one common base. There is then less danger of a weak spot. The secondary arms form the framework, and though they vary in number with varieties, the supply of light and air must not be interfered with. They must also be spaced to allow the proper development of the laterals. Their length must be consistent with strength to withstand the strain of the weight of the fruit and foliage, and also wind. Annual shoots are the temporary parts, and may be wood shoots, leaders, or laterals; laterals comprise fruit shoots, fruit and leaf twigs, leaf and fruit spurs, and fruit laterals. The correct shape assumed in pruning is that of a cup or inverted cone. A tree so pruned is economical. It facilitates cultivation, and allows the ground to be worked close up to the trees; spraying and pruning is more effectively carried out; picking the fruit is an easy matter; and the stem and main arms are well sheltered from strong sunlight. The correct cut starts on a level with the top of the bud from the opposite side, and extends across to just a little above the bud. If cut too far above, decay has an opportunity to cause trouble. If started too far below, the bud is impoverished, and probably a lower bud gains and upsets the balance of the tree. The terminal buds should be outside ones. They may be left on the side facing the direction the arm is desired to grow to fill up a vacant space. The only time when an inner bud is left is when an arm is assuming a horizontal position, and it is desired to give it a more upright growth. If a shoot is weak, it must be pruned hard to encourage strong growth. A strong, vigorous wood shoot must be pruned long to check the vigorous tendency, and bring it to the balance of the tree. The centre of the tree must be kept open, and any strong growing shoots in the centre entirely suppressed. Clean cuts heal more quickly than those that are bruised. Therefore, see that the pruning tools are kept clean and sharp, and are carefully used. When cutting with the secateurs the blade should always be nearest the tree, so that the clean cut surface is on the retained portion, and the bruised portion falls to the ground. The hook of the secateurs always bruises. Do not cut with a downward action more than is necessary; there is always the risk of splitting the wood or bark. Cuts made in a sloping direction avoid excessive moisture and heat, and permit of easy callousing. When it is necessary to use the saw, the sawn surface should always be smoothed over with a knife, and any rough bark removed. Large wounds benefit from a coating of tar or paint, and this should be given at once. A good plan is to carry a paint tin and brush around when pruning, and do each tree as pruned. Any thick old paint will do; if too thin it is liable to run down the limb and injure the bark. Remove all decayed and dead wood, and minimise the danger of fungi or insects getting in. All rubbish should be removed from underneath the tree. Winter spraying for various pests and diseases should be done. Woolly aphis can be sprayed with red oil emulsion or kerosine emulsion. Drive the spray in with good force, or if not very numerous the affected parts can be treated with the aid of a stiff bristled brush. Peach trees should be sprayed with Bordeaux mixture to check curl leaf.

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## MOORAK.

May 19th.—Present: 13 members.

**IMPROVING THE WORK OF BRANCHES.**—Mr. W. A. Palamountain contributed a paper on this subject. The purpose of the Agricultural Bureau, he said, was to assist the people on the land in their study in the conservation and application of energy, to assist the farmer to produce his particular commodity in a methodical and scientific manner, and to assist each person to rid his vegetation of parasites and his stock of disease. The Branch existed for the purpose of helping the people in the subjects in which they were interested, by one of the best means, i.e., mutual interchange of ideas so as to make individual knowledge into general and widespread information, modified or verified by friendly discussion. Continuing, he said “Theoretically it should be an easy enough task, but practically people are not easily persuaded of the true value of co-operation and of scientifically tabulated results of experiments. What is the reason? To me it seems that the chief difficulties are:—1. To convince a man that his humble individual experiment, and perhaps his failure, is worth everything to other people for the lesson it conveys. 2. To get busy men to take the time to make records of their work—tabulated statements of the measure of success achieved on the farm, in the garden, in the dairy, or in the stockyard. 3. To persist in making records for lengthened periods, so as to be able to institute comparisons with regard to climate and other conditions. 4. (And these cases are very few.) The secretive tendency in some leading them to keep a good thing to themselves for the advantage it gives them from a commercial point of view. 5. The innate dislike some have to get out of a groove. “I don’t want to hear of new-fangled ways. That which was good enough for my forbears is good enough for me,” we fancy we hear them say. It is an analagous case to that of the old peasant in England who was carrying his grist to the mill. He sat astride the old grey mare with the bag in front of him—the grist at one end and a huge stone in the other end to preserve the balance. Some enterprising acquaintance meeting him and learning the nature of the load, enquired, “Why don’t ’ee throw away the stone and shake half t’ grain to the other end of the bag? Balance ’tself then.” “Well, to think I never thought o’ that afore. Howsomever, my father did this way afore me and his father afore him,” returned the peasant. We can easily apply the moral. But if everyone had thought along these lines the experiment which led to the use of artificial manures would not have been carried out. The chemist could not have succeeded without the help of the practical agriculturist. Because the spirit of enterprise was fostered, the children who were taught to study nature discovered the nature of a hitherto unknown poisonous weed, and saved the lives of a thousand or two thousand pounds worth of stock in a district in Victoria. We have all spent a portion of our younger years at school, have had a good time in the playground, and possibly a bad time occasionally in the schoolroom. We have all learned something, if not as much as we might have. Do you think that time was wasted? Would you be without the memories of the old school? Do you think you would be as happy or as able men if you had never seen a school, and could neither read nor write? Our Branch of the Bureau should be something like the old school—a place in which to learn something, if only a little, and also to have a bit of fun sometimes. There is so much to learn. By coming together and comparing our ideas we can see where the other man’s method is better than our own, and we shall profit thereby if we are wise. These meetings also stimulate the Bureau member to strive to put his ideas into correct words, and this makes a sharper and more correct man of him. He will find that power of great use many times throughout his life. Further, this assembling together and discussing topics of general interest is going to pave the way for many future movements, such as co-operation in larger undertakings, not possible to one or two but easy of accomplishment when a number pull together. We know of men who will neither learn from anyone else nor let anyone know how they work things themselves if they can help it. Do not push your opinions down the other fellow’s throat, but be ready to compare notes and experiments and learn from one another. The last word in grazing, dairying, farming, and all kindred pursuits will never be spoken, and the subjects that crop up seem to be inexhaustible. Take our own district, for example. Dairying is, no doubt, the chief industry owing to the nature and adaptability of the country. We could divide this probably into 20 different subjects for discussion, and when finished possibly another 20 will have cropped up. Fifty years ago our sheep were

all shepherded and mostly yarded in high brush yards for the night. Now we have netted-in paddocks, and have beaten, to a large extent, wild dogs, scrub scab, etc., and are in a fair way to do the same with both the tick and rabbits. But still we have flies, foxes, grubs, lucerne flea, and hosts of other things to keep us busy. There are likely, also, to be such problems as exhausted pastures—injurious weeds taking the place of our good grasses that have been killed through over-stocking or continual feeding. Will it pay us to change our stock—sheep, cattle, horses, and pigs? Or shall we rest our pastures for a year or two? Shall we topdress them? Shall we test our herds? These are a few typical questions, and if the young members have vigorous inquiring minds, our Branch need never be in want of a subject of interest. *Rules for Members.*—It is our work to find a way to mend weak places in our economic situation. How can we create more interest in our meetings? First.—Let us be as regular as possible at each monthly meeting. Remember that membership carries with it responsibility, and that our attendance counts much towards the success of the meeting. Second.—Be punctual. This is a point in regard to our meetings that needs urgent attention. Remember that when the notice states 8 p.m. this does not mean that it will be near enough to arrive 15 or 20 minutes later. Third.—Be active. Assist the secretary by coming forward with either your contribution in the form of a paper or else make some arrangement for a substitute. Do not give him all the work and worry. Fourth.—Help your chairman. While the paper or address is being delivered, give your closest attention to same; pick out any dubious points as it is being read, and while this is being done refrain from speaking to another member. This is also a point in the conduct of our meetings which should be remedied. Members, I regret to say, seem to forget that their turn will come later. Fifth.—Members should

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keep to the subject under discussion and consideration, and any person speaking without addressing the chair should be called to order. Sixth.—Assist the treasurer by inquiring if the branch is in funds. Also let members talk about Bureau affairs before the general public, and work hard to get visitors to attend the meetings with them. Many of the visitors will be possible members. Seventh.—Let each member think no idea or experiment of his too insignificant to bring before the other members. Let him tell even of his failures. These are often better preceptors than successes. Some members have an idea that their education in writing, spelling, and grammar might hold them up to ridicule if they attempted to carry out their obligations to the bureau by writing a paper containing information gained by hard-earned, practical experience. This idea is very erroneous, and is also detrimental to the aims and results of the bureau. It does not require a primary school education to make a paper of this description valuable. It is the notes of actual experience in different experiments that make the paper valuable and instructive. The discussion and opinions of other members who are trying to produce a similar article under different conditions completes the attainment of the results sought. Eighth.—Keep in the foreground the necessity for procuring seeds, plants, material, and apparatus for experiments. Ninth.—Free and vigorous discussion is wanted in our meetings, and, so long as the argument is friendly and kindly, the crisper and more searching it is the better. A well-fitted line of experiment or argument, like a well-fitted machine, does not suffer by being dismembered and having its component parts critically examined. Let each member take his part in the discussion. Some are apt to think that because they have never spoken at a meeting they had better keep quiet. No so. We all have to make a start, and this is always the hardest part; but it will soon become quite natural. What is required is, not a lot of members, but rather a lot of interested members. Tenth.—Any member who writes a paper should give his subject careful thought; not put the matter off until the night previous to the meeting and then write the first thing that crosses his mind. Eleventh.—Meetings of members at farms, workshops, &c., for the purpose of seeing some experiment or process, or some invention bearing upon our work, should be held at least once a year. Homestead meetings are undoubtedly a great help to members, who can then see the various ways and means adopted by other members in working their holdings. Twelfth.—Combined meetings with other branches would, I believe, be the means of great assistance, and would tend to strengthen such an organisation as the Bureau. Thirteenth.—Farm competitions, such as have been carried out in other parts of the South-East would answer well on a smaller scale. These all help towards the advancement of better crops, better produce—hence better returns. The paper was much appreciated by the members present, and Mr. T. Barry moved a vote of thanks to Mr. Palamountain. Messrs. K. McIntosh, the President (Mr. J. F. Boardman), and Mr. O. Rehn also spoke.

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PENOLA (Average annual rainfall, 26.78in.).

June 4th.—Present: nine members.

SEEDING OPERATIONS.—Mr. Adamson contributed a paper on this subject. It was usually admitted, he said, that not sufficient attention was paid to the preparation of the land prior to seeding. In the heavy soils of their district the plough could be worked at a depth of 4in., but the depth should at all times be regulated according to the class of land. If the soil conditions permitted, he advised ploughing during the months of March and April, so as to be in readiness to commence with the harrows and cultivator immediately after the first winter rains. He had noticed a strong disinclination on the part of many farmers in that district to make a satisfactory job in the preparation of the seed bed, a common practice being to harrow the land, drill, and harrow again. That system was certainly rapid, but apart from that it had nothing to commend it. To ensure the success of the crop the seed bed should be perfect, and it was only by the unsparing use of the cultivator that that condition could be obtained. After the land had been thoroughly harrowed the cultivator should be brought into use, for the dual purpose of cutting out all weeds and giving the land a proper stirring, bringing the lumps to the surface and making a perfectly uniform bed of the fine soil particles

for the reception of the seed. The share cultivator, either spring type or of the heavier type, was, in his opinion, the best implement. Disc cultivators were not satisfactory, because the soil in that district became very sticky when at all damp. The drill should follow the cultivator as closely as possible, a good plan being to cultivate and drill on alternate days. The final harrowing was very important, because it should not only cover the seed thoroughly, but be the means of bringing all the weeds to the surface. He was of the opinion that June was the ideal month for seeding, but at the same time he did not wish to imply that crops could not be grown even when sown so late as the end of August, when the spring weather was favorable. He preferred sowing the crop during that month, rather than earlier in the year under unfavorable circumstances. The whole process of seeding depended entirely on weather conditions, but the land should not be worked when in a saturated state. He would sow wheat first, oats, and then barley. It was advisable to pickle wheat or barley if there was the slightest trace of smut; but if the seed was clean he would sow the grain dry, because the germination would not be retarded, and the plant would make rapid headway during the early growing stages, thus enabling it to better withstand the encroachment of weeds. One bushel of wheat or barley and from 1½ bush. to 1½ bush. of oats was considered the correct amount to sow per acre. If the land had been well worked, a moderate seeding would be found to have a decided advantage over a thick one, in so far as the grain yield was concerned. A good discussion followed the reading of the paper.

FRANCES, May 28th.—Mr. Pfitzner read an article, "Perennial Red Clover," and a good discussion followed. The Hon. Secretary (Mr. A. Herold) tabled samples of Cape barley grown for green feed. The experiment had been carried out under the auspices of the local Bureau. One sample had received a dressing of gypsum; the other no manure. The experiment proved that green feed could be grown with gypsum with very little rain. Members took a keen interest in the above experiment, and a good discussion took place.

FRANCES, July 2nd.—An article dealing with "The Tractor in Agriculture" was read by Mr. Atkinson. The Hon. Secretary (Mr. A. M. Herold) also read an article, "Fallowing." Interesting discussions followed the reading of both extracts.

KALANGADOO, July 9th.—The meeting was devoted to a discussion on items of local importance. The Hon. Secretary (Mr. D. W. Tucker) presented the annual report, which showed that seven meetings had been held during the past year, with an average attendance of eight members. The election of officers then took place.

MUNDALLA, July 20th.—TRACTORS—Mr. R. Hinge contributed a paper on this subject, after which a good discussion took place.

RENDELSHAM, August 13th.—The first meeting of the above Branch was held on August 13th, there being present 20 members and two visitors. A brief outline of the work of the Bureau was given by the Acting Chairman (Mr. R. Foster), and the officers of the Branch were then elected.

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**All communications to be addressed:**

**"The Editor, Journal of Agriculture, Victoria Square, Adelaide."**

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T. PASCOE,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### Conference of Hills Branches of the Agricultural Bureau.

The Annual Conference of Hills Branches of the Agricultural Bureau is to take place at Longwood on Thursday, October 13th. The Conference will be opened by the Minister of Agriculture (Hon. T. Pascoe, M.L.C.), and papers will be read by the following members of the Bureau:—"Electricity and Plant Life," Mr. R. Higgins (Longwood); "Fruit Growing," Mr. A. Filsell (Balhannah); "Irrigation and Pumping Plants for the Hills," Mr. H. Hoffman (Uraidla); "Poultry Industry," Mr. E. W. Beythien (Longwood); "Co-operation," Mr. C. Ricks (Cherry Gardens) and Mr. W. Nicholls (Longwood). In addition, the Lecturer in Forestry of the Adelaide University (Mr. Hugh Corbin, B.Sc.), will address the gathering. A number of Departmental officers will be present, and various subjects set down on the Agenda will be discussed.

### Conference of Eyre Peninsula Branches.

The third Annual Conference of Eyre Peninsula Branches of the Agricultural Bureau is to be held at the Government Experimental Farm, Minnipa, on October 20th and 21st. The gathering will be attended by a number of officers of the Department of Agriculture. Papers will be read by Mr. A. L. Robertson (Talia), "How to Lay Out a Farm"; Mr. R. L. Myer (Mount Hope), "Things Necessary for the Successful Development of Eyre Peninsula"; Mr. M. H. Way (Yadnarie), "Marketing and Weighing of Wheat"; Mr. P. A. Thompson (Talia), "Portable Engines on the Farm." Captain S. A. White, C.M.B.O.U., will deliver a lecture illustrated with lantern views. The Conference delegates will take the opportunity of inspecting the Farm, under the guidance of Departmental officers.

### Grasshoppers.

As a method of controlling grasshoppers, the Horticultural Instructor (Mr. Geo. Quinn) has suggested the following procedure:—If these are in patches in the hopper stage, by spraying the herbage they are feeding on, and all around them, with arsenate of lead, say, 1lb. in 20galls. of water, the insects can be poisoned. Care must be taken, however, to mow and destroy the lucerne and not feed the first cut, carrying the spray on it, to animals. The young trees could also be sprayed with the same compound to protect them, but the best way is to meet the locusts as described whilst yet away from the trees.



## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"L. G." Kingston, S.E., reports (1) cream gelding, 6 years, coat dull and rough, in low condition, and with a capricious appetite.

Reply—Put him on a ration; give him no more at a feed than he will eat with appetite. Water him before feeding. Provide him with a little crushed oats, in small quantities at first, but gradually increasing. Get the following powders:—Powdered nux vomica, 1½ drs., powdered bicarbonate of soda, ½ oz., powdered gentian root 12 oz.; mix. Give one tablespoonful twice daily in the feed. If he will not take the powder this way, mix it with a little treacle and give on the tongue and back teeth.

Also (2) pony mare with a sore shoulder of eight months' standing.

Reply—Pay proper attention to collar. Dress wound daily, and, after use, with the following lotion:—Sulphate of zinc 1 oz., acetate of lead 1 oz., water 1 pt. Apply with a swab. Shake the bottle before pouring out. Write again when the lotion is finished if it has not been effective.

"T. A. S.," Wirrabara, has cow with a proud-flesh growth on the lower eyelid.

Reply—The only treatment for such a condition is surgical removal. Powdered bluestone will cause irritation of the eye and will stimulate the growth.

"J. H.," Renmark, reports two geldings with colds.

Reply—These horses may have common cold (catarrh) or may be developing strangles. It would be advisable to isolate them. Water with a bucket. Put them on soft feed, green stuff, &c. Give Epsom salts 1 packet, chlorate of potash 1 teaspoonful daily in the drinking water. Do not drench them, but give the following mixture by smearing on the tongue and back teeth:—Green extract of belladonna ½ oz., camphor 1 oz., glycerine 4 oz., honey 4 oz.; mix. If a swelling develops under the jaw watch for abscess formation; lance as soon as you can detect the abscess, and dress daily with antiseptic solution.

"R. McW.," Leighton, has aged pony, lies down and stretches out as if dead. Very dull, and makes frequent attempts to pass water. Eyes are inflamed, and the pony is off his feed.

Reply—I recommend you to obtain movement of the bowel by the administration of a dose of raw linseed oil 1 pint, turpentine two tablespoonfuls. Give copious and frequent enemas (injections) of warm soapy water. Follow with tincture of nux vomica 1 teaspoonful, aromatic spirits of ammonia 1 tablespoonful twice daily in half a pint of water. Offer him water frequently with a bucket, and if he will eat give him sloppy food or green stuff.

"C. C. L.," Mypolonga, reports cow that after being blown with lucerne has developed an irritating cough.

Reply—Give her 1 oz. chlorodyne in half a pint of lukewarm water when she shows the "grippy" pain. If the cough still persists report to the Inspector of Stock, Murray Bridge.

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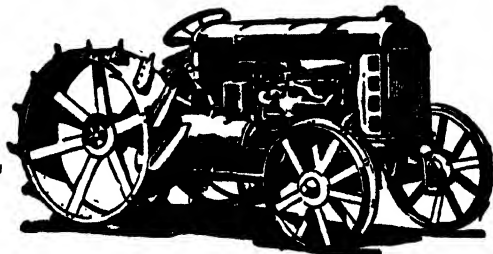
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Hon. Secretary, Agricultural Bureau, Wynarka, asks if there is any scientific basis for trying mare on the ninth day after service?

Reply—No, as normally the mare comes in season every two or three weeks. Should not this question read, "Is there any scientific basis for the trying of mare on the ninth day after foaling?" In this case the answer is "Yes," as the mare is in season on the seventh to the tenth day after foaling, the most favorable period for conception being the ninth day. If she does not conceive she comes in season again every two or three weeks. There does not appear to be any reason for believing that the practice is likely to induce abortion. Sexual desire normally disappears with impregnation, so that the mare would refuse the horse once she had conceived.

"R. N. P.," Monash, reports gelding in poor condition, and asks for treatment for the animal.

Reply—The most common causes of low condition are (1) Dietetic. Want of suitable or sufficient food. In this connection it would appear that the addition of concentrates in his ration would be helpful. He is fit only for the lightest work. Provide a warm loose box for him, and rug him at night. (2) Dental defects. If he does not masticate his feed or if he quids or salivates, have his mouth inspected, and his teeth attended to, if necessary. (3) Worms. Examine his droppings for worms. If you detect any, give him turpentine 2 tablespoonfuls, raw linseed oil 1pt. Mash him the day before. Give first thing in the morning on an empty stomach. If his appetite is satisfactory give him Fowler's solution of arsenic 1 tablespoonful twice daily in the feed for a fortnight.

Hon. Secretary, Agricultural Bureau, Wynarka, asks can a layman diagnose tuberculosis or any other disease rendering meat unfit for consumption?

Reply—If disease is sufficiently advanced there is obviously no difficulty. Special skill and training are required to decide what meat is fit and what unfit for consumption. In the absence of this knowledge one can only advise rejection of anything which is abnormal. There are, however, some cases of local disease which present no difficulty, and question 2 is a case in point.

Inquirer also asks if a sheep having had an ear removed for cancer, and the wound healed, is the meat fit for human consumption?

Reply—Yes.

Hon. Secretary, Shoal Bay Agricultural Bureau, asks remedy for horse with greasy heels.

Reply—Apply the following preparation:—Formalin 1 part, glycerine 5 parts, methylated spirits 10 parts; mix. It will facilitate treatment if the hair is clipped off. Apply the mixture with an old paint brush. Do not wash with warm water and soap. Mild cases of greasy heel will respond to dry dressings such as:—Oxide of zinc, boracic acid, powdered starch, equal parts.

"A. A. C.," Streaky Bay, has sheep blind in both eyes. The eyes have an inflamed appearance and discharge pus.

Reply.—This is a contagious inflammation of the eye. Separate those affected, and put them in a convenient paddock, with suitable provision for feed and water. Do not use sugar or dry solid substances. You can bathe with boracic solution if there is much discharge. Use one tablespoonful to a quart of water. Have the following lotion made up, and apply a few drops daily with an eyedropper:—Sulphate of zinc, 12grs.; tincture of opium, 1½ drams; distilled water, 4 ozs., and mix.

"J. H. K.," Cleve, reports death of wethers. *Post mortem* shows bladder full of cloudy, dark fluid; large kidneys, with red spots on them.

Reply.—The cause of death is urinary calculus (stone). If you will carefully follow the channel which conveys the urine from the bladder you should find the obstruction at the S-like curve of the penis.

"A. G.," Karoonda, seeks cure for horse with boils on shoulder.

Reply.—See that the collar is in good condition and free from sweat. Wash the shoulders with a solution of alum (one tablespoonful to a quart) every night after work.

"W. O. K.," Cleve, asks remedy to dry off the milk of a mare whose foal has died.

Reply.—After the death of the foal the mare can be dried off by partly milking her out. If she is not milked dry, but only sufficiently to relieve the tension, she will soon stop secreting milk. A little belladonna ointment may be used, but it should not be necessary.

"H. C. H.," Clarendon, reports young cow, second calf, three days after being served bled profusely from passage. Gone off food and losing condition.

Reply.—The cow has evidently sustained some injury during service. Douche her out for a few days with a gallon of weak lukewarm permanganate of potash solution. Give her some tonic medicine, such as tincture of nux vomica, one table-spoonful in a bottle of ale, twice daily for a few days. The abnormal condition of the milk is due to the state of her health, and should disappear with the above treatment.

"J. S.," Hawker, has horses that appear to be well until harnessed for work. They then stagger about. The same thing also happens when the animals are being driven in from the paddocks.

Reply.—I would advise putting horses affected in this manner out of work. Put them on stable feed, and give sufficient mash diet to relax bowels. If they do not appear ill unless put in harness this should be sufficient. Keep them off pasture containing suspected poison weed, and send samples of the plants for identification.

"R. S. T.," Blackheath, asks the effect of green peas fed to cattle just before the plants bloom.

Reply.—They will cause gas formation, but probably not to the same extent as clover. Any succulent green food may cause this trouble, especially if there is any sudden change to green food. Feed the peas in small quantities at first, and gradually increase the amount.

"H. H. O.," Streaky Bay, reports horse badly cut on knee with barb wire. Below the joint the muscle appears to be projecting about 3in. from the knee.

Reply.—Any projecting tissue may now be removed. First cleanse the part with warm soap and water. Use a clean, sharp knife. Cut away the projecting mass to the skin level. You should be able to do this without any restraint except a twitch. You can control the haemorrhage with a pad of dry cotton wool and a bandage.

"P. A. C.," Clare, reports horses with irritation of the hind legs, causing stamping, &c.

Reply.—This very common trouble is a parasitic disease. You will find treatment more effective if you clip the legs. Wash the legs thoroughly with warm water and soap, scrubbing well with a brush. Apply a mixture of sulphur and any bland oil, one part to four, rubbing it well into the legs. Three dressings at weekly intervals should be effective.

"A. B.," Parilla, reports cow, calved in December last; animal contracted milk fever, followed by mammitis. Prior to pumping air into the udder half a pint of linseed oil was injected into the womb. The inquirer now reports sterility.

Reply.—This treatment is of no value in cases of milk fever, but it should not have any harmful effect. The only treatment necessary was inflation of the udder with air. An examination of the cow would be required to determine the cause of her failure to breed. The injection of baking soda solution, 4oz. to the pint, will correct an acid condition of the organs which sometimes causes the trouble.

"W. E. R.," Yallunda Flat, reports heifer that has been unable to use one hind leg subsequent to calving a month ago.

Reply.—The probable cause of her inability is a fracture of the pelvis. If no improvement has been noted during the last week or two, she is unlikely to recover. It is likely that she will continue to lose condition and become weaker, and I would advise you to destroy her. When you do this, make an examination of the leg to ascertain the nature of the injury.

"J. J. O.," Rameo, asks what measures to adopt to prevent cow from sucking herself.

Reply.—A rod fixed to a head stall and to a girth around the body is usually effective.

"W. P.," Alawoona, has gelding with a swelling as large as a plate high up on the off shoulder.

Reply.—The swelling is probably due to an injury, and is partly due to extravasation of blood under the skin. Continue fomenta, but do not use them above blood heat. Put him on soft food. You may have to drain the swelling by opening it at the lowest part, but before doing so, write, giving exact position, appearance, whether hard or soft, hot or painful, and does it appear to contain fluid.

"H. E. B.," Echunga, reports:—(1) Failure of a sow to breed; and (2) large teats on udder of cow.

Replies.—(1) This may be due to some abnormality of the breeding organs, such as cystic ovary, imperforate condition of the mouth of the womb, or it may be due to inflammation of that organ (subacute), which is one of the commonest causes of sterility. Closure of the entrance to the womb necessitates dilatation by means of suitable instruments. Catarrhal inflammation of the womb may be treated by irrigating the genital passage with weak disinfectant solution, such as permanganate of potash, in lukewarm water. A household enema syringe can be used for giving the injection. I do not think that this is a hereditary condition. (2) I do not think it would be wise to interfere with the one or two larger ones. If, however, they have a neck, you might apply a ligature. The long and also horny ones may be excised with a pair of sharp scissors. If you apply a ligature to the fleshy ones, treat only one at a time. It is stated that warts can be removed entirely by smearing the teats thickly with olive oil after each milking. Small flat warts may be easily got rid of by caustic applications, such as lunar caustic or pure (glacial) acetic acid.

"E. W. P.," Koppio, asks:—(1) Cure for three-year-old filly with "slipped" off shoulder. (2) Can any medicine be placed in the water trough to help keep horses free from worms? (3) What can be done for horses that are constantly rubbing their legs on fences and rails? (4) Can a layman remove a growth that is covering the eye of a horse, and what is the best method to adopt?

Replies.—(1) This is an injury likely to occur when colt breaking. It is accompanied by marked wasting of the muscles, and it may be some time before recovery takes place. Rest is necessary. An application of red blister, 1 to 8, may be useful. (2) No effective worm medicine can be given by medium of the trough. There should, however, be no trouble about administering Fowler's solution of arsenic, one tablespoonful, twice daily in the feed for a fortnight. (3) The irritation of the leg is due to a parasitic affection. Wash the legs with warm water and soap, scrubbing in well with a brush. Apply sulphur one part, oil four parts, rubbing in thoroughly. The treatment will be more effective if the legs are first clipped. Three dressings at intervals of a week should effect a cure. (4) If not extensive, this should not be difficult to remove. You should have some boracic solution (one dessertspoonful to a pint), clean cotton rag, 2 drams of 5 per cent. cocaine solution, a pair of curved scissors, a scalpel (small knife), and a pair of forceps. Cleanse the part first with boracic solution; soak a small piece of cotton wool in the cocaine, and place it within the eyelid; hold the lids together for a minute or two; repeat this two or three times. This will reduce the sensibility of the part to pain, but to be quite effective the solution should be injected into the tissues with a hypodermic syringe. The growth is then held with the forceps, and removed from its attachments by means of the knife or scissors. The use of the scissors is recommended where possible, and will cause less bleeding. Mop up the blood from time to time with a piece of cotton rag. Dress daily afterwards with boracic solution. Small growths in the corner of the eye can usually be dealt with without casting the animal. In this case apply a twitch.

"F. C. C.," Booborowie, has cow with a small hole in the side of the teat following a cut from barbed wire.

Reply—This is a milk fistula, and although treatment is not difficult when the cow is dry, it may present some difficulty during lactation. Try the use of caustic in the form of a stick of lunar caustic. Put a point on the pencil and cauterise the walls of the fistula. Continue the use of milking tube, but boil it for five minutes in water with a little washing soda before use.

"H. T.," Morechard, reports medium draught gelding, five years, with eyeballs turning inwards.

Reply—It is impossible to make a diagnosis on a single symptom, but if this horse has had a wound of some kind, such as a prick in the foot during the last week or two, and if the peculiar condition of the eyes is accompanied by stiffness of the body and peculiar stiff attitude when standing, you may conclude that he has tetanus. Put him in a dark loosebox, and disturb him as little as possible. Give him soft food. Place his food and water at a convenient height from the ground. Give 3oz. or 4oz. Epsom salts daily in drinking water. Do not drench him, and give him the following:—Extract of belladonna,  $\frac{1}{2}$ oz., tencle 4oz. (mix). Give one tablespoonful on the tongue twice a day.

"P. J. C.," Dawson, has fat pony with depraved appetite, and suffers with attacks of colic.

Reply—The attacks of colic are due to her manner of feeding, and can only be dealt with by putting her on a definite ration and feeding her little and often. Regular hours of feeding are important. Give in the feed:—Powdered nux vomica  $\frac{1}{2}$ oz., carbonate of soda 3oz., powdered gentian 3oz. (mix). Divide into 12 powders. Give one twice daily in the feed.

"E. M. S.," Port Lincoln, seeks cure for cow with swollen eyes. The eyes are hot and discharging matter and water. Inquirer also asks if sulphate of iron administered with nux vomica is harmful to pregnant cows.

Reply—Bathe daily with warm boracic lotion, and afterwards apply a few drops of the following lotion with an eyedropper:—Sulphate of zinc 6grs., tincture of opium  $\frac{1}{4}$ dr., distilled water 2oz. (mix). Sulphate of iron used in medicinal doses is not harmful to pregnant cows.

"F. W.," Stockport, reports mare with itchininess of the skin, particularly around the feet.

Reply—You will find treatment more effective if you clip the legs. Wash them thoroughly with soap and warm water, and when dry rub in sulphur ointment made by mixing 1 part of sulphur to 4 of lard. Repeat this treatment two or three times at intervals of one week. If the skin irritation extends to the body surface, use, instead of sulphur ointment, the following dressing:—Sulphur  $\frac{1}{2}$ lb., quicklime 1lb., water 1gall. Simmer this over the fire for two or three hours. Allow it to settle, pour off the clear yellow fluid (reject the sediment), and make up to 1gall. with water. Bottle this for use. Apply with a swab to the parts affected.

"H. S.," Gladstone, has six-year-old gelding falling away in condition, fore legs swollen and stiff. Horse is running in paddock.

Reply—It would be advisable to bring him in and feed him. Give him the following powders:—Powdered nux vomica  $\frac{1}{2}$ oz., powdered gentian 3oz., bicarbonate of soda 3oz. (mix). Divide into 12 powders. Give one twice daily in the feed. Examine his droppings occasionally for worms.

"C. L. D.," Tothill's Belt, has four-year-old filly with a swelling under the jaw.

Reply—This may be a sequel to a previous attack of strangles, but it is improbable that there is pus formation in the region, and therefore no reason for opening it. The appearance of an abscess is more or less characteristic, and finally results in pointing, the condition you have been expecting. The application of fomentations, blisters, &c., would have stimulated abscess formation had there been any tendency to it. I advise you to keep her out of work a little longer. Give her a teaspoonful of iodide of potash daily dissolved in a little water and mixed with a little bran.

"G. P.," North Moonta, reports failure of cow to get in calf after repeated services.

Reply—Failure of conception is due to a number of causes such as disease of the ovaries, their tubes, or the womb, injuries to the latter or the genital passage, inflammatory changes. It may be due to the presence of an acid secretion from the lining membrane of the parts. I advise you to irrigate the passage with an alkaline douche a short time before service. Use 5ozs. soda bicarbonate to a gallon of lukewarm water. Inject with a short piece of rubber tubing and a tin funnel.

## DEPARTMENTAL DOINGS.

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### AGRICULTURE, ETC.

During the month of September the Director of Agriculture (Prof. Arthur J. Perkins), attended the Annual Congress of the Agricultural Bureau at which he delivered an address entitled "The Pig Industry: A Neglected Source of National Wealth"; visited some of the irrigation settlements with the Ministerial party; and also visited Neeta Irrigation Settlement in connection with grading matters.

### DAIRYING, ETC.

The Dairy Expert (Mr. P. H. Suter), visited Murray Bridge, Neeta, and Long Swamp. On September 26th Mr. Suter attended the meeting of the Inman Valley Branch and delivered an address, "The Dairying Industry."

Mr. H. J. Apps (Assistant Dairy Expert), visited the following dairying centres:—Currency Creek, Goolwa, Jamestown, Yongala, Snowtown, Nuriootpa, and Murray Bridge. This officer also inspected dairies and milk depots in the city and suburban areas.

### POULTRY.

The Government Poultry Expert (Mr. D. F. Laurie), visited Balaklava on September 22nd, and gave advice concerning the lay-out of a poultry run to Mr. P. Roediger. A visit of inspection was also paid to Mr. G. F. Dawbarn, of Gawler, where an extensive poultry plant is being erected under departmental supervision.

### FARM BUILDINGS, ETC.

On September 21st the Field Engineer (Mr. J. Paull), visited the Taplan Agricultural Bureau and delivered an address, "Building Construction."

Mr. C. H. Beaumont attended and opened the Conference of South Australian Fruitgrowers' Association on September 30th.

### GENERAL.

The Secretary Advisory Board attended a meeting of farmers at Owen and established a Branch of the Agricultural Bureau there. He also attended and addressed the annual meeting of the Mundalla Branch of the Agricultural Bureau.

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## EXPERIMENTAL FARM HARVEST REPORTS.

### VEITCH'S WELL EXPERIMENTAL FARM.

[By W. J. SPAFFORD, Superintendent Experimental Work, and  
 L. SMITH, Manager.]

This farm is situated in the hundred of Allen, 158 miles from Adelaide, on the Loxton Railway. It contains about 3,800 acres of land, the bulk of which is sandy, the remainder running to shallow light-loam soils overlying hard limestone rock—conditions similar to thousands of acres of surrounding country.

#### THE SEASON 1920.

The results secured from the cereal crops, as set out below, show that the season was a good one, and a glance at the rainfall table reveals that it could hardly have been other, for the total rain which fell reached 15.50in., and of this, nearly all was received during the growing period of the crops. The first four months of the year were almost rainless, which necessitated seeding the crops "dry," and as no hindrances to this operation occurred, the great bulk of the grain was in the ground before sufficient rain fell to germinate any of it. May and June gave a fair amount of rain, and as the soil was still warm, a good germination and strong young growth resulted. July proved rather dry, with its total fall of only a little over three-quarters of an inch, but from then onwards to the ripening of the crops, almost ideal



falls of rain were recorded. The distribution of the year's rainfall, together with that since 1909, is set out in the table below:—

*Rainfall Distribution—Veitch's Well, 1909-1920.*

	Means, 1909- 1913.	1914.	1915.	1916.	1917.	1918.	1919.	1920.	Means, 1909- 1920.
	In.	In.	In.	In.	In.	In.	In.	In.	In.
January .....	0.34	0.31	0.48	0.18	0.45	0.07	0.20	0.10	0.30
February .....	1.31	0.56	—	0.03	2.60	0.23	5.49	—	1.30
March .....	2.07	1.06	—	0.10	0.78	0.49	0.36	0.33	1.06
April .....	0.10	1.01	0.51	0.20	0.24	1.00	0.26	0.33	0.34
May .....	1.68	0.52	1.33	0.43	1.15	1.31	1.88	1.45	1.32
June .....	1.88	0.35	1.91	1.97	1.01	1.08	0.37	1.29	1.45
July .....	1.17	0.38	0.63	2.43	1.14	1.39	0.29	0.79	1.08
August .....	1.08	—	1.67	4.01	1.91	2.36	0.53	2.19	1.51
September .....	2.16	0.15	1.99	2.57	2.01	0.22	0.76	3.10	1.80
October .....	0.79	0.15	0.56	1.64	2.38	0.98	0.45	3.66	1.15
November .....	1.05	1.10	0.19	2.04	1.72	0.07	0.62	0.95	1.00
December .....	0.72	0.65	0.56	1.09	1.21	—	2.03	1.31	0.87
Total .....	14.36	6.24	9.83	16.69	16.60	9.20	13.24	15.50	13.15
"Useful" rain (April-November) ..	9.91	3.66	8.79	15.29	11.56	8.41	5.16	13.76	9.65

The distribution of the "useful" rainfall is set out in the next table, and shows very clearly that not only was the total rainfall for the period good, but the fair seeding rains, good winter and spring falls, and sufficient early summer rain to enable the crops to mature properly, was an almost ideal distribution.

*Distribution of "Useful" Rainfall—Veitch's Well, 1920.*

	1920.	Means, 1909-1920.
	In.	In.
Seeding rains (April-May) .. . . .	1.78	1.66
Winter rains (June-July) .. . . .	2.08	2.53
Spring rains (August-October) .. . . .	8.95	4.46
Early summer rains (November) .. . . .	0.95	1.00
Total "useful" rainfall .. . . .	13.76	9.65

**CROPS.**

In the fields cereals were the only farm crops grown, and, as a matter of fact, only very small plots of other agricultural plants were tried.

*Wimmera Rye Grass.*—In 1919 a plot of land about three-quarters of an acre in extent was sown with Wimmera Rye Grass, and although the seed germinated well, the growth made was not good in that low-rainfall year. This plot of grass was grazed off with the remainder of the field, and the livestock used—sheep and horses—took to the forage readily. Enough seed had fallen to reseed the plot properly, for in the autumn of 1920 a really good germination resulted over the whole plot, and as the balance of the field was in crop, livestock did

not have access to this plot, and the growth made was thick and quite 2ft. 6in. high.

*Hay Crops.*—A block of about 61 acres in Field No. 11 was the only piece sown solely for hay, but with 32 acres of cereal mixture originally sown for green forage, and not being needed by the livestock, it was left to mature for hay, and headlands cut from the fields sown for grain, the total area harvested for hay reached 122.21 acres, and from this 220 tons were stacked, which equals 1 ton 16cwts. 0lbs. per acre.

The next table sets out all hay crops harvested at Veitch's Well since 1910:—

*Hay Returns—Veitch's Well, 1910-1920.*

Year.	Total "Useful"		Area. Acres.	Total Yield.			Yield per Acre.		
	Rainfall. In.	Rainfall. In.		T.	C.	L.	T.	C.	L.
1910 . . . . .	16.19	10.15	82.00	82	0	0	1	0	0
1911 . . . . .	13.36	7.28	121.50	74	18	0	0	12	37
1912 . . . . .	11.57	10.19	218.00	109	0	0	0	10	0
1913 . . . . .	14.95	8.27	140.00	70	0	0	0	10	0
1914 . . . . .	6.24	3.66	100.00	Total failure.					
1915 . . . . .	9.83	8.79	158.00	180	0	0	1	2	88
1916 . . . . .	16.69	15.29	127.08	243	0	0	1	18	27
1917 . . . . .	16.60	11.56	69.01	110	0	0	1	11	98
1918 . . . . .	9.20	8.41	78.89	93	16	0	1	3	87
1919 . . . . .	13.24	5.16	109.88	45	0	0	0	8	21
1920 . . . . .	15.50	13.76	122.21	220	0	0	1	16	0
Means . . . . .	13.04	9.32	—	—	—	—	0	19	43

This season's yield is quite a satisfactory one for these particular conditions, and its inclusion in the mean average for the farm brings it up to 19cwts. 43lbs. per acre for the 11-year period, 1910 to 1920.

*Oat Crops.*—All told, 157.08 acres of oats were harvested, about 86 acres of which crops were on stubble land in Field No. 1, whilst the remainder was on fallowed land in Field No. 11. Field No. 1 carried a crop of barley in 1919, and received a light skim-ploughing between January 28th, 1920, and February 2nd. Drilling of Algerian oats, at the rate of 60lbs. of seed, with 1cwt. superphosphate, was commenced on April 7th, and completed on April 14th, and the whole block was then harrowed. Field No. 11 was ploughed between July 28th and August 27th, 1919, cultivated in October and early January, drilled between March 24th and April 10th, and was finally harrowed immediately after seeding. The results secured from these plots are arranged below:—

*Oat Variety Yields—Veitch's Well, 1920.*

Variety.	Field Grown. No.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Algerian . . . . .	11	33.92	775 37	22 35
Calcutta . . . . .	11	9.27	180 30	19 20
Sunrise . . . . .	11	28.11	290 20	10 3
Algerian . . . . .	1	85.78	863 30	10 3
Farm average . . . . .	—	157.08	2,110 37	13 18

The yields secured from the various crops of oats are no correct criterion of the growth made, as in every case, even including the stubble crop in Field No. 1, rank, luxuriant growth was made, but the crops lodged badly, and the portions of both fields under oats were extremely stony, with the inevitable consequence, through not being able to lower the harvesting machines sufficiently, that much grain was lost. The inclusion of the season's return in the mean average oat yield of the farm reduces it from 20bush. 24lbs. per acre for four years, to 19bush. 7lbs. per acre for the five years from 1916 to 1920, as is to be seen below:—

*Oat Returns—Veitch's Well, 1916-1920.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.		Yield per Acre	
	In. In.	In. In.		Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.
1916 . . . . .	16.69	15.29	12.39	478	37	38	26
1917 . . . . .	16.60	11.56	50.19	1,396	35	27	33
1918 . . . . .	9.20	8.41	40.43	253	24	6	11
1919 . . . . .	13.24	5.16	39.17	379	12	9	27
1920 . . . . .	15.50	13.76	157.08	2,110	37	13	18
Means . . . . .	14.25	10.84	—	—	—	19	7

*Barley Crops.*—The barley crops harvested for grain were grown on fallow in experimental plots (28.28 acres) and in Fields Nos. 2A and 2B, part of which was "new" land, and part on wheat and rye stubbles. Fields Nos. 2A and 2B were skim-ploughed between May 28th and June 8th, and immediately worked down with harrows, and between June 6th and 12th the varieties of barley were drilled in at the rate of 50lbs. of seed, with 1cwt. superphosphate per acre, and the whole block was again harrowed. The yields obtained, together with the farm average for the year, are detailed in the following table:—

*Barley Variety Yields—Veitch's Well, 1920.*

Variety.	Area. Acres.	Total Yield.		Yield per Acre.	
		Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.
Tunis, 4B . . . . .	23.19	875	30	37	37
Tunis, 1 (exp.) . . . . .	28.28	815	40	28	42
Cape . . . . .	8.44	230	40	27	16
Tunis, 4 . . . . .	6.90	170	20	24	34
Roseworthy Oregon . . . . .	6.39	140	18	18	18
Farm average . . . . .	73.20	2,232	48	30	25

Considering that the great bulk of the crop was not grown on fallowed land, the average yield of 30bush. 25lbs. per acre is very satisfactory, particularly when it is remembered that much of the land of this farm is very stony, and has many mallee stumps still in it, both things preventing the collecting of lodged crops with the ordinary harvesting machinery. The seasons in which the crops grow sufficiently rank to lodge at this farm are unfortunately not of common occurrence, but 1920 happened to be one of them.

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The next table gives details of the barley crops grown at this farm since 1915:—

*Barley Returns—Veitch's Well, 1915-1920.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
	In.	In.			
1915 .. .. .	9.83	8.79	22.72	248 9	10 46
1916 .. .. .	16.69	15.29	20.10	517 20	25 37
1917 .. .. .	16.60	11.56	44.03	1,104 10	25 4
1918 .. .. .	9.20	8.41	49.68	305 5	6 7
1919 .. .. .	13.24	5.16	83.18	185 46	2 12
1920 .. .. .	15.50	13.76	73.20	2,232 48	30 25
Means .. .. .	13.51	10.49	—	—	16 38

The mean average yield of 16bush. 38lbs. per acre, although not very high, is quite satisfactory for the conditions of the district, as can be realised by comparing it with the mean average yield of 13bush. per acre received from the wheat crops for the same period—1915 to 1920—although the great bulk of the latter crops were grown on fallowed land, whereas the most of the former were produced on wheat stubbles.

*Rye Crops.*—A much larger area than has been the usual practice of the past was seeded this year, and the 16.78 acres harvested averaged 10bush. 33lbs. per acre. The results secured from this crop since 1916 at this farm are shown in the next table:—

*Rye Returns—Veitch's Well, 1916-1920.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
	In.	In.			
1916 .. .. .	16.69	15.29	0.36	3 12	8 53
1917 .. .. .	16.60	11.56	5.98	71 16	11 55
1918 .. .. .	9.20	8.41	5.00	15 40	3 8
1919 .. .. .	13.24	5.16	2.75	2 50	1 2
1920 .. .. .	15.50	13.76	16.78	177 2	10 33
Means .. .. .	14.25	10.84	—	—	7 6

*Wheat Crops.*—Other than in permanent experimental plots, all wheat crops were grown in Fields Nos. 3 and 11. Field No. 3 was mainly fallowed land, with a small part "new" land, but as this latter was composed of a number of odd pieces, and the varieties of wheats were seeded right across the field, separate records could not be kept. The fallowed land was ploughed between August 28th and September 27th, 1919, cultivated early in October, and again in January, and wheats were drilled in between April 15th and May 3rd. Field No. 11 was ploughed between July 28th and August 27th, 1919, cultivated in October and early January, and seeded between March 24th and April 10th. All wheat crops in both fields were harrowed immediately after the drill.

The yields obtained from all wheat varieties grown are detailed in the next table.

*Wheat Variety Yields—Veitch's Well, 1920.*

Variety.	Field Grown. No.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Red Russian . . . . .	11	13.47	363 54	27 8
Queen Fan . . . . .	3	16.77	441 6	26 18
Caliph . . . . .	3	31.68	806 56	25 28
Yandilla King . . . . .	3	34.60	871 20	25 10
Baroota Wonder . . . . .	3	13.58	319 31	23 31
Federation . . . . .	3	5.69	131 20	23 2
Late Gluyas . . . . .	3	22.91	451 53	19 43
Gluyas . . . . .	3	35.51	685 56	19 19
Walker's Wonder . . . . .	3	8.29	158 47	19 9
Silver Baart . . . . .	11	16.51	312 44	18 56
Cumberland . . . . .	3	9.09	170 40	18 47
King's Red . . . . .	3	11.27	196 20	17 25
Fortune . . . . .	3	8.29	140 25	16 56
Cadet . . . . .	3	3.05	49 28	16 13
Marshall's No. 3 . . . . .	3	12.90	195 30	15 9
Triumph . . . . .	3	3.00	43 8	14 22
College Eclipse . . . . .	3	5.29	73 50	13 57
Baroota Wonder . . . . .	Exp.	28.28	780 42	27 36
Baroota Wonder . . . . .	Exp.	7.40	191 25	25 52
Farm average . . . . .	--	287.52	6,384 55	22 12

The yields recorded above are easily the best yet secured at the farm, and is largely accounted for by the fact that the rainfall was both plentiful and well distributed, but the land being freed from stumps, thus admitting of more thorough soil working, also has a fair amount to do with the good growth which resulted. All of the varieties which gave really heavy yields—Red Russian, Baroota Wonder, Queen Fan, Caliph, Yandilla King, and Federation—are well known in most districts of the State, and are all popular varieties.

The addition of this year's yield of 22bush. 12lbs. per acre to the wheat crops received at the farm since 1909, brings the mean average yield up to 10bush. 56lbs. per acre, which is 1bush. 2lbs. greater than for the period 1909-1919.

The next table gives details of the wheat crops grown at the farm since 1909:—

*Wheat Returns, Veitch's Well, 1909-1920.*

Year.	Total Rainfall. In.	"Useful" Rainfall. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
1909 . . . . .	14.45	13.04	22.00	396 0	18 0
1910 . . . . .	16.19	10.15	197.50	2,156 0	10 55
1911 . . . . .	13.36	7.28	620.90	5,080 30	8 11
1912 . . . . .	11.57	10.19	569.00	5,544 18	9 45
1913 . . . . .	14.95	8.27	791.40	4,742 28	6 0
1914 . . . . .	6.24	3.66	951.00	325 30	0 21
1915 . . . . .	9.83	8.79	602.11	6,681 51	11 6
1916 . . . . .	16.69	15.29	407.74	7,102 20	17 25
1917 . . . . .	16.60	11.56	469.91	7,156 50	15 14
1918 . . . . .	9.20	8.41	287.89	1,905 28	6 37
1919 . . . . .	13.24	5.16	263.62	1,419 32	5 23
1920 . . . . .	15.50	13.76	287.52	6,384 55	22 12
Means . . . . .	13.15	9.65	—	—	10 56

Although the mean average yield of 10bush. 56lbs. per acre is not very high, it is quite satisfactory for these particular conditions, and a fairly considerable increase in this figure can be looked for in the future, when the land is properly cleared of mallees and scrub generally, and as experience teaches us the best methods of soil working, and best varieties to use.

The behavior of the majority of varieties of wheats grown at this farm since 1916 are shown in the table below:—

*Yields of Varieties of Wheat—Veitch's Well, 1916-1920.*

Variety.	1916.		1917.		1918.		1919.		1920.		Means 1916-20.		Means 1918-20.	
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
Red Russian . . . .	13	12	20	24	14	45	7	36	27	8	16	37	16	30
Yandilla King . . . .	21	8	18	2	10	35	3	18	25	10	15	39	13	1
Federation . . . . .	25	33	19	31	4	9	4	38	23	2	15	23	10	36
Walker's Wonder . . .	18	41	21	30	8	18	6	30	19	9	14	50	11	19
Queen Fan . . . . .	22	56	16	46	2	54	4	36	26	18	14	42	11	16
Baroota Wonder . . .	16	20	17	54	5	30	6	7	26	13	14	25	12	37
Gluyas . . . . .	16	54	17	44	9	53	6	44	19	19	14	7	11	59
Cumberland . . . . .	16	26	17	59	8	29	5	10	18	47	13	22	10	49
College Eclipse . . . .	20	18	14	34	9	23	5	21	13	57	12	43	9	34
Late Gluyas . . . . .	17	53	18	13	3	40	2	13	19	43	12	20	8	32
Silver Baart . . . . .	14	13	14	31	3	55	9	22	18	56	12	11	10	44
King's Early . . . .	16	9	15	14	5	9	4	34	17	25	9	45	9	3
Fortune . . . . .	—	—	—	—	9	18	9	6	16	56	—	—	11	47
Cadet . . . . .	—	—	—	—	9	3	8	8	16	13	—	—	11	8
Marshall's No. 3 . . .	—	—	—	—	7	40	5	38	15	9	—	—	9	29
Caliph . . . . .	—	—	—	—	—	—	7	50	25	28	—	—	—	—
Triumph . . . . .	—	—	—	—	—	—	—	—	14	22	—	—	—	—
Farm average . . . .	17	25	15	14	6	7	5	23	22	12	13	16	11	14
Total rainfall . . . .	In. 16.69		In. 16.60		In. 9.20		In. 13.24		In. 15.50		In. 14.25		In. 12.65	
"Useful" rainfall . . .	15.29		11.56		8.41		5.16		13.76		10.84		9.11	

During the period shown above—1916 to 1920—Red Russian has been the best yielder of the wheat varieties grown, with Yandilla King and Federation producing an average of about 1bush. per acre less than it. Red Russian has proved itself a really good grain producer in most of the "limestone" districts of South Australia, and has much to commend it to farmers, being beardless, standing well, threshing easily, and does not readily shake out, but it is so very liable to be affected by "bunt," that many people do not grow much of it. This objection to such a good wheat otherwise, should not hold good nowadays, as we know that "bunt" can be eradicated from crops by thorough "pickling" of the seed to be sown. Walker's Wonder is deservedly popular in some of our low-rainfall districts, but could be grown to a still greater extent to the advantage of the wheat yield of the State.

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## EXPERIMENTAL PLOTS.

The first series of permanent experimental plots, where the various treatments to be given, whether of cultivation or manuring, are to be continued for a number of years on the same blocks of land, has been mapped out for both wheat and barley, and consist of manurial and cultivation tests.

*Manurial Plots with Wheat.*

The permanent manurial plots with wheat, being worked on the following rotation:—(1) Pasture, (2) bare fallow, (3) wheat—carried their first crops this season, with the following results:—

*Permanent Manurial Plots with Wheat—Veitch's Well, 1920.*

Plot.	Manuring per Acre.	Yield per Acre. Bush. lbs.	
1	$\frac{1}{2}$ cwt. superphosphate . . . . .	28	43
2	1 cwt. superphosphate . . . . .	28	19
3	2 cwt. superphosphate . . . . .	32	29
4	3 cwt. superphosphate . . . . .	31	37
5	No manure . . . . .	24	59
6	1 cwt. superphosphate, $\frac{1}{2}$ cwt. sulphate of potash . .	28	18
7	1 cwt. superphosphate, $\frac{1}{2}$ cwt. nitrate of soda . . .	26	59
8	1 cwt. super, $\frac{1}{2}$ cwt. sulph. potash, $\frac{1}{2}$ cwt. nitrate soda	29	53
9	No manure . . . . .	21	18

*Cultivation Tests with Wheat.*

A series of experimental plots, worked on the following rotation:—(1) Pasture, (2) bare fallow, (3) wheat, and having as their object the testing of the different methods of cultivating bare fallow for the growing of wheat, was commenced in 1920, and the results secured from these plots are set out below:—

*Cultivation Plots with Wheat—Veitch's Well, 1920.*

Plot.	Treatment.	Yield per Acre.	
	<i>Early Fallow (June-July).</i>	Bush. lbs.	
10	Ploughed 4in. deep and harrowed within a few days. (Cultivated whenever weeds or a crust rendered necessary.) . . . . .	27	5
11	Ploughed 4in. deep and left rough throughout the winter. (Cultivated whenever weeds or a crust rendered necessary) . . . .	28	19
12	Ploughed 4in. deep, rolled within a few days, and cultivated or harrowed according to circumstances. (Cultivated or harrowed whenever weeds or a crust rendered necessary) . . . .	27	33
	<i>Late Fallow (September).</i>		
13	Ploughed 2in. deep, and cultivated whenever weeds or a crust rendered necessary, but not rolled . . . . .	24	19
14	Ploughed 4in. deep, heavily rolled the same day as ploughed, and immediately harrowed. (Cultivated whenever weeds or a crust rendered necessary.) . . . . .	26	32

*Manurial Plots with Six-rowed Barley.*

On the idea that light-textured soils in low-rainfall conditions should be utilised to produce barley crops rather than wheat crops, as is the case in other low-rainfall countries, a series of manurial plots with six-rowed barley on the—(1) Pasture, (2) bare fallow, (3) barley rotation has been arranged, and in these plots the same system of manuring as for the wheat manurial plots is being practised. The first crop was carried on the plots in 1920 with the following results:—

*Manurial Plots with Six-rowed Barley—Veitch's Well, 1920.*

Plot.	Manuring per Acre.	Yield per Acre. Bush. lbs.
28	$\frac{1}{2}$ cwt. superphosphate . . . . .	34 22
27	1 cwt. superphosphate . . . . .	28 15
26	2 cwt. superphosphate . . . . .	29 47
25	3 cwt. superphosphate . . . . .	25 6
24	No manure . . . . .	27 36
23	1 cwt. superphosphate, $\frac{1}{2}$ cwt. sulphate of potash . .	26 3
22	1 cwt. superphosphate, $\frac{1}{2}$ cwt. nitrate of soda . . .	32 22
21	1 cwt. super, $\frac{1}{2}$ cwt. sulph. potash, $\frac{1}{2}$ cwt. nitrate soda	25 6
20	No manure . . . . .	24 10

*Cultivation Tests with Six-rowed Barley.*

As in the case with the manurial plots, the cultivation tests on the—(1) Pasture, (2) bare fallow, (3) wheat rotation, were duplicated as to treatment with six-rowed barley as the crop instead of the wheat. These tests were also commenced in 1920, and yielded as follows:—

*Cultivation Plots with Six-rowed Barley—Veitch's Well, 1920.*

Plot.	Treatment.	Yield per Acre. Bush. lbs.
<i>Early Fallow (June-July).</i>		
19	Ploughed 4in. deep and harrowed within a few days. (Cultivated whenever weeds or a crust rendered necessary.) . .	29 10
18	Ploughed 4in. deep and left rough throughout the winter. (Cultivated whenever weeds or a crust rendered necessary.) . . .	26 7
17	Ploughed 4in. deep, rolled within a few days, and cultivated or harrowed according to circumstances. (Cultivated whenever weeds or a crust rendered necessary.) . . . . .	30 41
<i>Late Fallow (September.)</i>		
16	Ploughed 2in. deep and cultivated whenever weeds or a crust rendered necessary, but not rolled . . . . .	34 8
15	Ploughed 4in. deep, heavily rolled the same day as ploughed, and immediately harrowed. (Cultivated whenever weeds or a crust rendered necessary.) . . . . .	30 3

*Rate of Seeding Tests.*

A block of land in a fallowed field has been selected during each of the past six years, and has been divided into plots, all of which

have received a dressing of 1cwt. superphosphate per acre, but each one had a different quantity of seed wheat sown on it. The same variety of wheat was used on all plots in each individual year, and other than the amount of seed used on the plots, their treatment was identical. The results obtained over this period, 1915 to 1920, are set out below:—

*Quantitative Seed Tests—Veitch's Well, 1915-1920.*

*(Tests on Wheat Sown with 1cwt. Superphosphate per Acre.)*

Year.	30lbs. Wheat.		45lbs. Wheat.		60lbs. Wheat.		80lbs. Wheat.		Total "Useful" Rainfall.	
	B.	L.	B.	L.	B.	L.	B.	L.	In.	In.
1915 . . . .	9	47	10	9	10	45	9	57	9.83	8.79
1916 . . . .	18	9	19	1	19	5	18	39	16.69	15.29
1917 . . . .	22	53	23	42	23	56	26	31	16.60	11.56
1918 . . . .	7	20	8	39	8	53	8	41	9.20	8.41
1919 . . . .	7	21	7	20	7	51	8	34	13.24	5.16
1920 . . . .	24	56	25	49	25	12	27	29	15.50	13.76
Means . . . .	15	4	15	47	15	57	16	38	13.51	10.49

Although the differences between the results secured from these plots, as disclosed in the mean yields, are not very marked, they are sufficient to show that, in this district:—

1. 30lbs. of seed wheat is not sufficient for the best results.
2. The yields increase as the amount of seed wheat used is increased to 80lbs. of seed per acre.
3. The greatest net increase of crop, over and above the crop produced from 30lbs. seed wheat per acre, is secured by using 80lbs. of seed per acre.

*Fertiliser Tests.*

As it will be some years before the results to be secured from the permanent manurial plots can be properly compared, and as tests with various dressings of superphosphate on wheat crops have been conducted on fallow land, it will be instructive to tabulate the yields obtained over the past six years:—

*Quantitative Fertiliser Tests—Veitch's Well, 1915-1920.*

Year.	No Manure.		½cwt. Super.		1cwt. Super.		2cwts. Super.		3cwts. Super.	
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
1915 . . . . .	11	52	13	15	13	43	13	40	13	19
1916 . . . . .	13	39	17	7	18	49	18	32	21	31
1917 . . . . .	20	47	23	48	25	30	21	17	25	15
1918 . . . . .	5	17	6	20	7	28	8	22	9	9
1919 . . . . .	9	15	9	28	9	43	10	37	8	58
1920 . . . . .	23	8	28	43	28	19	32	29	31	37
Means . . . .	14	0	16	27	17	15	17	29	18	18

## HINTS FOR SETTLERS STARTING IN MALLEE LANDS.

[By C. P. HODGE, Instructor for Mallee Lands.]

Whilst travelling through the mallee districts it has struck me most forcibly that many of the failures in these areas are largely due to inexperience and a total lack of knowledge of how to set about the undertaking. The explanation for this is largely to be found in the fact that these are cheap lands, and consequently attract men who have had no previous experience of farming, but wish to settle on the land with a small outlay of capital. It is in the hope of assisting such men that I have thought it expedient to set down some suggestions which I think will be helpful to those making a start on a mallee block, and there may also be something of use to those who have been longer settled.

In the matter of selecting a mallee block, great care must be exercised in its choice, and I would strongly recommend those who have had no previous experience seeking the advice of a man with a knowledge of mallee country as to the merits of the block; but for the guidance of those who may not be able to obtain the opinion of an experienced man I will set out the following points, which should be of assistance in making a choice for himself.

1. The average annual rainfall for the district. If it be a newly opened area, and there be no local records kept, then obtain those closest to the locality.

2. Nature of the soil, whether it be of a sandy or clayey nature, and its relation to the rainfall. If the soil be of a sandy nature the rainfall will not require to be so heavy as would be the case with a "heavier" nature of soil.

3. Proximity of block to railway siding.

4. Nature of roads over which produce will have to be hauled to railway.

5. Success or otherwise of adjoining settlers.

6. Nature of scrub growing on the block. This is an important point, for the relative production of the land can be gauged fairly accurately by the nature of the natural growth thereon. It may be taken as a general rule that the larger the mallee the better and stronger the soil, though it must not be overlooked that most of our lands carrying large mallee are situated in the lower rainfall areas, so that these two points must always be considered in correlation.

7. Possibilities of obtaining water for livestock purposes.

8. Proximity to a school or possibility of obtaining a school within reasonable distance.

These are amongst the more important points to be considered in the selection of a mallee block, and, presuming that the settler has found a block of mallee land conforming to most if not all these requirements, I shall endeavor to point out the course to adopt in developing it.

### WATER SUPPLY.

The first care in settling on any block of land is, of course, to secure a supply of water for livestock. This will be obtained by one of the three following means:—(1) By boring; (2) by sinking a well; (3) by surface catchment. The settler must ascertain the method of obtaining water in vogue in the district. This is a matter of very great importance, for the method adopted will determine largely the site to be chosen for the well or tank.

However, whichever method be adopted it is important that due consideration to subsequent subdivision of the block be borne in mind, so that the same supply will provide water for at least four paddocks ultimately. Never sink a well or put down a bore close to the boundary of a block; rather go into about the centre, though the actual position chosen will depend largely on the shape and size of the block.

The selection of a fairly central point for the home and water supply is, of course, also important from the point of view of economy of working, for you will thus be fairly equidistant from all sides of the block, and will in consequence have less distance to travel to and from work. However, before deciding on the site, set out on paper a definite system of subdivision it is intended to adopt, and put the bore or well or tank as near the intersection of two cross lines as possible.

Having decided on the site for the water supply, suitable sites for the dwelling-house and farm buildings somewhere adjacent must next be selected. Having fixed on the site for the home and water supply, the work of making provision for water supply, whether it be a bore, well, or tank, and the erection of the house should be put in hand straight away.

### ROLLING.

The next care, of course, will be the rolling or chopping down a portion of the scrub in preparation for the first crop. In this connection I would strongly advise the settler to pay someone else to cart out his building material, &c., and also to let his first piece of scrub rolling, for it must be remembered that he is presumably going to a virgin block of scrub country with no shelter for his team, no water, and no feed, so that should he take his own team with him to do his own carting and rolling, they will have to undergo great hardship from lack of shelter, and horse feed will have to be purchased for them for at least 18 months before he can hope to have any of his own. Whereas if he were to let his carting and rolling for the first year it would only be necessary for him to take one horse and a spring dray as a means of transport for himself, thus being free of the worry of looking after his team; he could confine his energies to putting up his stables and yards and house, and thus have everything ready to receive his livestock and implements by the time he would require them to put in his first crop.

In rolling down his first piece of scrub, reference should be made to the plan of subsequent subdivision, and a track cut around one of the proposed paddocks wide enough to allow the team to pass through with the roller. As to the area to be rolled down, the settler must be

guided by the horsepower and plant he has available, always remembering that he must never roll down at one time more scrub than he can effectively handle. His first rolling should provide sufficient land for him to crop that season, and also provide land to fallow for the following season, say, 400 acres in all.

#### BURNING.

Remember that it is important to have the rolling done as early as possible to enable the larger sticks to become thoroughly dry, otherwise some of these may remain unburnt, and cause much hand labor in removing them before cultivation. It is of equal importance to cut down all the mallee which is not broken by the roller, commonly called "spring backs," otherwise these will not be burnt by the fire, and will cause trouble to subsequent cultivation. Much depends on the success of this first burn, for on the nature of the burn the result of the subsequent crop largely depends. For if a good, clean burn be not obtained, the mallee is not only not checked to the same extent, but the presence of unburnt mallee and other shrubs greatly interferes with the work of cultivation, thus prejudicing the chance of a successful crop.

Before setting fire to the rolled scrub, a good firebreak must be prepared on all sides of the rolled patch. This should be at least a chain wide, and is best prepared by picking up all the mallee from a strip about 5yds. wide along the outer edge of the rolling, throwing it inwards and on the rolled scrub, then go in a chain and repeat the performance, and plough up both these cleared strips. Then on a cool day, with a favorable wind, set fire to the mallee between the two strips of ploughing.

Having secured a good firebreak, all that now remains is to await a favorable day for burning. March is the best month so far as checking the mallee is concerned, but it is rather risky waiting so long, for should a heavy fall of rain occur, it may be difficult to obtain a successful burn. Even so I would advise waiting until the first favorable day in March, being careful to give your neighbors notice of your intention to burn on a given day. There should be at least four men present when the burning takes place.

I am of the opinion that the advantages gained by waiting until March before burning, more than justify the risk one runs of rain intervening to spoil the burn, for if the burning be done in February the sap is still rising in the mallee, but by March it is just about stationary, and it is at this stage that fire has the most serious effect on mallee. If burnt in February, and the fire be shortly followed by a rain, shoots will appear in a very short time, and these will probably have attained sufficient height to necessitate their being cut before harvest.

Always start lighting on the side opposite to the direction from which the wind is blowing. Two of the men start lighting from the centre of this side, and work in opposite directions, lighting as they go, the other two men following, and watching that the fire does not jump over the break. Having got to their respective corners, the two lighting should start working up the sides, being careful to keep

about level with one another until they reach the two corners of the side from which the wind is blowing, when they both start lighting this side towards one another. Every precaution should be taken to prevent the fire escaping into the standing scrub, for should such happen the difficulties of clearing are greatly enhanced.

We will presume that a good, clean burn has been obtained, and the land is now ready for cultivation.

#### CULTIVATION.

I know there are many who claim that there is no need for any cultivation when putting new burnt country under crop, but that it is sufficient to drill the seed straight in on the burnt surface. Whilst admitting this practice has the advantage of being cheap and expeditious, I do not advise it, for it is not a good practice, and may eventually prove costly. It must always be borne in mind that the cheapest and most effective means of clearing mallee scrub is through the agency of fire, and consequently it should be the settler's aim to do everything he can to obtain a crop with sufficient straw to carry a stubble fire the following summer. It is for this reason that new lands should be cultivated prior to seeding. If one takes a spade and turns up a portion of this soil, it will be found to contain a perfect net work of small fibrous roots, as well as larger surface roots belonging to the mallee. By cultivation the greater number of these surface roots are severed, and thus prevented from robbing the crop of moisture and nutriment.

I know there have been instances where settlers have grown really good crops by simply drilling the seed in without other cultivation, but this practice will only prove successful occasionally when the season happens to be very wet and otherwise favorable. It is in the drier and less favorable seasons, which certainly predominate throughout our mallee areas, that the benefit of cultivation will be demonstrated. The implement to be employed for this cultivation will, of course, depend to a certain extent on the soil conditions in which one is working, but as a general rule, the most suitable for this purpose will be a light cultivating plough—or skim plough as it is mostly called. Care must be taken, however, not to plough the land deeply; a depth of 2in. will be quite sufficient in this instance, for if ploughed to a greater depth, the land will be too loose, and full of air spaces beneath the seed-bed.

Wheat should be sown as the first crop at the rate of 45lb. per acre, with 100lb. superphosphate, and care should be exercised to select a variety that has been proved successful in the district, or if it be a new district, choose a vigorous-growing variety, which will give the maximum amount of straw. The land should be harrowed before and after the drill.

As soon as the crop is in, commence fallowing the other portion of burnt scrub, so that it may be open to receive as much of the winter rains as possible. The skim plough may again be used for this purpose, but it should be set about 4in. deep. Do not put much draught on the plough, for stumps pulled out at this stage necessitate a considerable amount of labor in picking them up and carting off. It is better to kill the stumps in the ground as much as possible, and



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plough them out later, when you will have more time for such work, and they will be ploughed out much more easily. As most of the mallee lands are of a more or less sandy nature, I should advise leaving this land in the rough state throughout the winter months. In the spring, say, in September, it should be cultivated, the skim plough again being used, though for this working the depth should be reduced to 2in. Should rain fall after this cultivation, the land should be harrowed to break the hard crust.

After the fallowing is completed, say, in August, another 200 acres of scrub should be rolled, and the "spring backs" cut. This will be burnt the following March to provide land to be cropped next season. Harvest will now be drawing near, and I would advise purchasing a good second-hand stripper and winnower for harvesting the first two or three crops, care being taken to save all the cocky chaff, as this will prove a valuable stand-by for horse feed. I would not advise cutting any hay this first year, for the crop is sure to be very light, and it is of paramount importance to secure a stubble burn if possible. It will pay better to reap all the crop and purchase oats, bran, and hay-chaff to be fed with the cocky chaff.

It will be found that knocking the straw will greatly enhance the chances of securing a good stubble burn, and for this purpose I would recommend fixing a roller—a piece of 2in. pipe, or, better still, 4in. bore casing, with a piece of iron or wood passed through it, to which chains are fastened, will serve the purpose very well—beneath the comb of the stripper.

Before setting fire to the stubble, which, by the way, should be left again until March, it will be wise to try it first with the firerake. If you have not a firerake and do not wish to incur the expense of buying one, an ordinary set of stump-jump harrows, with only two rows of teeth, will be found to answer the purpose almost equally well. Start raking on the opposite side of the field from which the wind is blowing, striking through about half a chain from the edge. It will then be seen whether the stubble is sufficiently thick to secure a running fire or not. If it is thought that the fire will run, continue with the firerake around the edge of the stubble until the side from which the wind is blowing is reached; drive along this side with the firerake, and the wind will carry the fire across the field.

However, should there be doubts about securing a running fire, do not light the stubble on the windward side, for the result will probably be that the fire will only burn in strips, and it is then very difficult to firerake the remainder. In such a case, it is much better to firerake the whole field, working backwards and forwards from the leeward side of the field. It will be found that the firerake or harrows will do very much better work if a sheet of iron or other covering be fastened over the top of the rake, thus throwing all the heat of the fire down on to the ground, thus more effectually scorching the shoots.

Presuming that the wheat has all been carted, we now have to consider the second year's crop.

#### THE SECOND YEAR'S CROP.

The piece of land which was sown to wheat the first year, the stubble of which has just been burnt, should be worked with the skim plough

as soon as possible, and sown to oats at the rate of 50lb. seed with 100lb. super per acre early in April. The object of growing oats is that they provide a heavier stubble, and also one that burns much more readily than wheat, and the matter of obtaining this second stubble fire is of the utmost importance, for, should one be successful in doing so, one can safely rely on fully 90 per cent. of the mallee being killed, and the land is then in a condition to be fallowed or left out of cultivation. It will be found that the land which was fallowed the first year will have grown a crop of shoots. I would advise cutting these shoots in March and subsequently burning them with the fire-rake, so that the land is free of shoots before the crop is drilled in.

Wheat at the rate of 45lb. per acre, with 100lb. super, should be sown on this fallow, and so the system would proceed, viz., 200 acres wheat on fallow land or new land and 200 acres oats on the previous year's wheat stubble, until the mallee has all been killed on the first land cropped; this would then be fallowed and sown to wheat the following year, when the second 200 acres would be ready to be dealt with in a similar manner, 200 acres of land free of shoots being secured each year thence onward.

As each 200 acres becomes free enough of mallee to be left out of cultivation, it should be enclosed by a sheep-proof fence, which will, of course, form one of the subdivision fences decided on when first starting operations. Burn the wheat stubble in March, and drill in a bushel of oats per acre for feed. It will be found of the utmost importance to introduce sheep as soon as possible, for they will not only keep in check the secondary growths which always make their appearance on mallee country after the mallee has been eradicated, but they will also improve the physical condition of the soil to a wonderful extent, besides, of course, providing another source of revenue.

To sum up, the system of working I advise is:—

First year.—Roll 400 acres, of which 200 acres is cropped to wheat and 200 acres fallowed.

Second Year.—Sow 200 acres previously in wheat to oats and 200 acres of fallowed land to wheat. Roll 200 acres.

Third Year.—Sow 200 acres that carried wheat previous year to oats. Sow 200 acres new land to wheat. Fallow first 200 acres tackled.

Fourth Year.—Sow 200 acres previously in wheat to oats and 200 acres old fallowed land to wheat, also 200 acres new land to wheat.

Fifth Year.—Sow 200 acres new land to wheat; 200 acres previously in wheat to oats; 200 acres old land fallowed to wheat. Burn off wheat stubble on old cleared land and drill 1bush. oats per acre for feed. Sheep-proof fence this field.

This system can then be followed until the whole block is cleared, and sheep-proof fenced as it becomes clear. Of course, it may be found that it is not always possible to obtain stubble fires, in which case the clearing operations will be delayed. In such a case I would suggest growing a second crop of oats.

But the point which must be remembered above everything else is not to roll down fresh country unless you are satisfied that you can cope successfully with what you already have in hand. Undertake

comparatively small areas, and put them in well, rather than large areas scratched in. Good cultivation will always pay. After the first year, of course, you will cut your own hay from the oat crop, and see to it that you cut plenty for your own requirements each year.

As soon as the stage is reached when there is land to be fallowed on which all the mallee has been killed, it would be advisable to purchase a strong though not too heavy five-furrowed fallowing plough. Hitch a team of eight horses to this plough and put a fair amount of draught on, though not too much, for you will find some of the stumps are still difficult to dislodge, and if too much draught be put on, the team will be continually pulled up, which will result in considerable waste of time, irritation and hard work for the driver in freeing the bodies, and unnecessary jarring of the horses' shoulders.

At the prices ruling for mallee roots it will certainly pay to cart the stumps off the fallow, and either cart them straight in to the railway or else stack them, to be carted later when there may be more time available, or the price of stumps improves. In any case, if within seven or eight miles of the railway, and the road be reasonably good, it will pay to cart them. In the matter of stabling and implement sheds, the nature of the building erected will largely depend on whether there be any suitable scrub timber available. But even if forks and rails have to be railed up from the hills, I would advise the erection of straw-covered stables and implement sheds in preference to galvanized iron, for the reason that the variation in day and night temperatures in the lands east of the Murray more particularly is very pronounced, and this variation will not be nearly so severe where straw-covered sheds are used, as would be the case with galvanized iron.

In erecting fencing, if rabbits be numerous, and there are adjoining blocks which are not being cleared, I would advise the erection of wire netting on all boundary fences. The division fences 3ft. 4in. in height, posts half a chain apart, with three wooden droppers between the posts; five No. 10 galvanized wires, spaced: bottom wire 4in. from ground, then 5in., 5in., 5in., 6in., and 7in. and a barbed wire 8in. above the last plain wire on top of the posts.

There are several other points which I should like to have touched on, though I think the foregoing fairly covers the ground which I set out to traverse. I have here outlined a definite system of working a mallee farm, from the beginning until the whole block is cleared of mallee, by which time, of course, it can be worked on the same lines as any other farm, and I feel sure that if new mallee settlers will adopt some such system as I have laid down, they will escape much of the drudgery of shoot-cutting and the disappointment of poor returns, which are so often the case where haphazard methods are adopted, with no fixed aim in view, and though I grant they will have to work hard, each year they will have their allotted amount of work to be done, they will gradually see their methodical scheme bearing them steadily towards their final goal, with the minimum of effort to themselves, and with very much better monetary returns.

I see no reason why any able-bodied man, with, say, £500 capital, who is prepared to work hard, and will adopt the system here laid down, should not make a successful mallee settler.

## MURRAY BRIDGE HERD TESTING SOCIETY.

## RESULTS OF BUTTERFAT TESTS FOR JUNE, 1921.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during June.	Per Cow during June.	Per Cow October to June.	Per Herd during June.	Per Cow during June.	Per Cow October to June.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/A	12-93	9	6,780	524-23	4,884-46	332-41	25-70	230-51
1/B	14-27	11-83	4,346	304-63	5,013-85	224-03	15-70	222-07
1/C	44-80	34-87	24,715	551-67	4,912-59	1,086-45	24-25	202-02
1/D	18	16-77	10,886-5	604-81	4,235-44	560-19	31-12	210-45
1/E	15	13	7,080	472-00	4,866-40	357-93	23-86	232-73
1/F	11	7-27	3,289	299-00	4,375-63	156-23	14-20	182-67
1/G	49	45-13	37,870-5	772-87	7,291-27	1,507-10	30-76	276-89
1/H	16	14-47	7,481-5	467-59	4,309-78	345-72	21-61	188-25
1/I	10	9-07	5,168	516-80	5,547-69	218-69	21-87	232-78
1/J	16	14-80	7,602	478-88	5,512-14	377-22	23-68	249-86
1/K	13	12-43	6,295-5	484-27	4,874-84	314-17	24-17	217-65
1/L	13	9-07	5,361-5	412-42	4,587-54	258-56	19-89	209-83
1/M	14	11-30	5,063	361-64	3,474-48	254-56	18-18	164-01
1/N	—	—	—	—	2,301-68†	—	—	100-07†
1/O	31	23-40	14,556-5	469-56	3,286-33*	696-55	22-47	152-73*
1/P	18	16-57	7,502-5	416-81	3,187-66*	376-07	20-89	144-13*
1/Q	—	—	—	—	1,241-91†	—	—	49-01†
1/R	10-20	10-03	4,907	481-08	1,132-08†	259-28	25-42	55-26†
Means	19-14	16-19	9,935-28	519-15	5,061-02	457-82	23-92	218-51

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† For two months only.

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## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

## THIRTY-SECOND ANNUAL CONGRESS.

The thirty-second Annual Congress of the Agricultural Bureau of South Australia was held in the Victoria Hall on September 12th, 13th, and 14th, 1921. There was a record attendance of delegates and a large number of visitors. During the sessions the following delegates attended:—Alawoona—S. Finney, C. Tiller; Aldinga—C. Lovelock, W. R. Pengilly; Amyton—H. K. Gum, T. Ward; Angaston—Rev. Nelson, W. Sibley; Arthurlton—W. Short, T. Howlett; Ashbourne—W. H. Cuming, R. H. Haines; Balaklava—P. H. Roediger, H. M. Tuck; Barmera—W. Driscoll, R. Walmsley; Beetaloo Valley—J. McIntosh, J. Burton; Berri—A. G. Jarvis, P. M. Wilksch; Big Swamp—T. Smith, J. W. Winch; Blackheath—W. J. and H. G. Pym; Black Springs—J. Hudd, E. I'Anson; Blyth—A. L. McEwin, W. J. Nannes; Booleroo Centre—E. Berry, J. Stanton; Borrika—A. Dohnt, R. Hood; Brentwood—A. Twartz, H. Launer; Brinkley—A. Martin, A. Richards; Bute—L. Simon, W. H. Sharman; Butler—S. Butler, A. Pfizner; Cadell—A. Tonkin, R. Frankel; Canowie Belt—R. J. Carter; Carrow—G. Reed, J. Beare; Cherry Gardens—C. Ricks, A. Stone; Clanfield—J. Cockshell, L. Orwell; Clare—W. Patullo, C. Jarman; Clarendon—P. Hawkes, T. Brooks; Claypan Bore—J. Gray, J. Entwistle; Cleve—T. Slater, H. Hamilton; Coomandook—R. Upton, M. Wilkin; Coonalpyn—J. Cronin, F. Tregenza; Coonawarra—C. Alder, C. Skinner; Cradock—A. E. Clarke, T. Fitzgerald; Crystal Brook—A. Clarke, W. Robinson; Cummins—B. Black; Cygnet River—F. Wakelin, J. Osterstock; Edillilie—A. Quinn, T. Knight; Elbow Hill—W. Cooper, P. Wheeler; Eurelia—F. Dinon, J. Kildea; Frances—J. McLean, A. Herold; Gawler River—F. Bray, T. Rice; Geranium—O. Lang, F. Lillecrapp; Gladstone—J. Sargent, A. Blesing; Glencoe—J. Riddoch, A. von Duve; Glossop—T. Partridge, J. Hamlyn; Goode—H. Smith; Green Patch—C. Whillas, E. Chapman; Gumeracha—H. Buckely, F. Lee; Hartley—H. Stanton, W. Hudd; Hawker—J. Smith, C. Hirsch; Hookina—M. Henschke, A. Lindblom; Inman Valley—D. Nosworthy, B. Mayfield; Kadina—J. Cowley, W. Correll; Kalangadoo—W. Rogers, D. Tucker; Kanmantoo—A. and W. Mills; Keith—A. Densley, W. Morecom; Ki Ki—T. Cooley, O. Blucher; Kilkerran—S. Keightley, B. Koch; Kingston-on-Murray—J. Wetherall, J. Pobke; Kongorong—E. Morrison, S. Dixon; Koppio—V. Gardner, R. Schultze; Kybybolite—H. Schinckel, B. Bottrill; Lake Wangary—J. Shepperd, A. Puckridge; Lameroo—W. Morecom, H. Hayman; Laura—E. Blesing, J. Watt; Lone Gum—M. Nicholas, S. Paterson; Lone Pine—A. Lehmann, T. Fromm; Loxton—P. Thiele, A. Traeger; Lucindale—W. Secker, J. McInnes; Lyndoch—J. Hammatt; MacGillivray—R. Wheaton; MacLachlan—W. Hayman, W. Hawke; Maitland—C. Pearce; Mallala—J. Arnold, J. Catt; Meadows—G. Ellis, H. Michelmore; Meribah—M. Hank; Milang—W. Yelland, E.

Williams; Millicent—J. Bell, G. Major; Mindarie—J. McCabe, T. Stott; Mintaro—H. Schunke, W. Jones; Monarto South—W. Braendler, B. Schenscher; Moonta—T. Cliff, — Atkinson; Moorak—J. Boardman, H. Tarrant; Moorook—F. Pattersen, W. Munn; Morchard—J. Scriven, R. Fabian; Morphett Vale—A. Anderson, A. Furniss; Mount Barker—H. Hunt, E. Steven; Mount Bryan—A. Jefferies, E. Thomas; Mount Bryan East—J. Thomas, J. Doyle; Mount Gambier—W. Manser, D. Collins; Mount Hope—R. Myers, G. Vigar; Mount Pleasant—R. Tapscott, L. Harding; Mount Remarkable—E. Mooney, H. Shields; Mundalla—H. Donnell, T. Dunbridge; Murray Bridge—F. Martin, J. Fletcher; Myponga—H. Bartle; Mypolonga—B. Foster, H. Clark; Nantawarra—R. Nicholls, C. Pridham; Naracoorte—A. Feuerheerdt, H. Langeludecke; Narridy—J. Darley, A. Pascoe; Narrung—J. Steer, L. Mann; Netherton—C. Wilkin, A. Coates; North Booborowie—E. Dunstan, H. Mayfield; North Bundaleer—M. Cronin, J. Gerke; Nunkeri and Yurgo—H. Sanders, D. Bicknell; Orroroo—W. Zanker, A. Brice; Parilla—A. Stevens, H. Johnston; Parilla Well—D. Fergusson, E. Slater; Parrakie—S. Lewis, F. Gravestock; Paskeville—G. Baumann, J. Pontifex; Penola—W. Clifford, D. Adamson; Petina—W. Schulz, — Howard; Pinnaroo—E. Parsons, H. Davis; Pompoota—A. Walker; Port Broughton—J. Vanstone, J. Lewis; Port Elliot—H. Smith, J. Brown; Port Germein—E. Alford, A. Trestrail; Rameo—F. G. Rogers; Redhill—S. Pengilly, H. Torr; Renmark—F. Basey, H. Taylor; Riverton—T. Longbottom, E. Gray; Riverton (Women's)—Mesdames T. Longbottom and I. Schultz; Roberts and Verran—H. Smith, M. Masters; Rockwood—J. Bradford, S. Collett; Rosedale—H. Nettlebeck, F. Wolf; Rosy Pine—G. McCabe, C. Lee; Saddleworth—J. Morecom; Saddleworth (Women's)—Mesdames Crawford and Warnecke; Salisbury—H. Bussenchutt, R. Bagster; Salt Creek—K. Fraser, H. Horndardt; Sandalwood—J. Hood, W. Willoughby; Shoal Bay—H. Noske, G. Barrett; Smoky Bay—G. Lovelock, W. Caddy; Stockport—G. Weste, R. Whitelaw; Strathalbyn—H. Butler, D. MacCheriton; Talia—P. Thomson, F. Lewis; Tantanoola—E. Altschweger, J. Kennedy; Taplan—W. Hammond, P. Hodge; Tarcowie—J. Nunn, O. Davidson; Tatiara—T. Hill, A. King; Two Wells—S. Wasley, E. Jenkin; Virginia—W. Lang, W. King; Waikerie—H. Milner, L. Pope; Wanbi—F. Falkiner, G. Harrington; Warcowie—T. Ryan, S. Growden; Watervale—G. Holder, R. Newland; Whyte-Yarcowie—G. McGregor, S. Robinson; Wilkawatt—W. and D. Bowman; Williamstown—J. Bain, G. Brown; Williamstown (Women's)—Mesdames Cundy and Hammatt; Willowie—A. Bartlett, H. Hughes; Wilmington—J. Hannagan, B. Jericho; Wirrabara—P. Curnow, E. Stevens; Wirrega—C. Muir, C. Williams; Wolowa—F. Sullivan, A. Stirling; Wudinna—W. Bartley, P. Symonds; Wynarka—J. Beck, W. Richardson; Yacka—W. Tillbrook, J. Rundle; Yadnarie—P. Dolling, O. Forbes; Yallunda—W. Cabot, S. Fairbrother; Yaninee—G. Scholz, W. Hirschfeld; Ycelanna—K. Dunn, W. Wemyss; Yongala Vale—A. Jamieson, G. I'Anson; Younghusband—G. Brinsley, G. Mann; Balhannah—H. Spoehr, H. Wicks; Winkie—C. Plush, H. Dalziel; Rendelsham—H. Stewart, S. Smith; Windsor—N. Baker, H. White.

## THE OPENING SESSION.

Congress was opened at 8 p.m. on Monday, September 12th, by His Excellency the Governor (Sir W. E. G. A. Weigall, K.C.M.G.). Mr. C. J. Tuckwell (Chairman of the Advisory Board of Agriculture) presided, and among those present were the Treasurer (the Hon. G. Ritchie), Lieutenant-Colonel W. Ramsey Smith, M.D., D.Sc., F.R.S. (Edin.), (head of the Department of Public Health, &c.), the President and Secretary of the Royal Agricultural and Horticultural Society (Messrs. J. W. Sandford and J. Riley, O.B.E.), the Speaker of the House of Assembly (Sir Richard Butler), the Director of Agriculture (Professor Arthur J. Perkins), the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch, B.Sc. (Agric.) M.R.C.V.S.), Mr. P. H. Suter (Government Dairy Expert), Mr. Geo. Quinn (Horticultural Instructor), the Wool Instructor of the School of Mines (Mr. Codrington), and the following members of the Advisory Board of Agriculture:—Colonel Rowell, C.B., Captain S. A. White, C.M.B.O.U., Messrs. T. H. Williams, A. M. Dawkins, F. Coleman, W. S. Kelly, and the Secretary (Mr. H. J. Finnis)

The Chairman (Mr. C. J. Tuckwell) apologised for the absence of the Minister of Agriculture, and extended a very hearty welcome to His Excellency on behalf of the Advisory Board, and called on him to open the Conference.

## THE GOVERNOR'S ADDRESS.

The Governor, in declaring the conference open, said:—"I am extremely glad to wish you many happy returns of your 32nd birthday. During the past year I have been able to find out something about the aims and aspirations of the farming community. It has been said that I spend far too much of my time and energy in agricultural pursuits. I make no apology for it, neither from the public nor personal standpoint. (Cheers.) I cannot help it. I have spent my life farming, and I do not hesitate to say that I am far happier in a farming atmosphere than I am in any other. I look upon this gathering as the most important event in the year in South Australia. It is the most representative gathering of the master key of industry of South Australia. There are present delegates from all the Branches of the Bureau, and the Bureau system is the parent of all agricultural activity in the State. If it had not been for the Bureau system we should not have had a Ministry of Agriculture in this State. During your 32 years of activity you have been the real engine, the real driving power. I am also glad to welcome the President and Secretary of the Royal Agricultural Society. (Cheers.) The more you join hands with that organisation the better for the State. I am also glad to see members of the Legislature present. The more they come here and join with the ordinary practical agriculturist the better again for agricultural activity. (Cheers.) But let me say that the less this great industry becomes the shuttlecock of Parliamentary and political controversy the better. (Cheers.) The whole future prosperity of the State depends upon agricultural prosperity, yet you have got a very large proportion of your population here aggregated and segregated within a radius of ten miles of this hall. We are not all producers, but we are all consumers, and if you look at these questions

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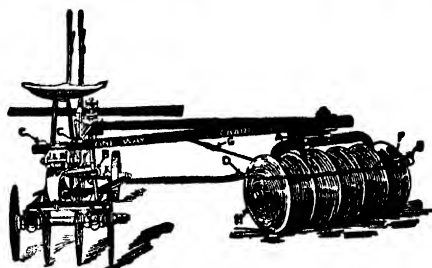
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through the spectacles of a consumer, you get a very different idea of the art of agriculture from that held by the man who is merely a producer. Those who by the very nature of things can only look at affairs through the spectacles of a consumer should be brought into the closest possible touch with the practical producer, and realise that there is another aspect upon which depends, not only the prosperity of the producer, but also the State, and bound up in the prosperity of the State is the prosperity of every consumer.

#### THE GOVERNMENT A MILCH COW.

“What is the relation of the State to the Government? If Mr. Ritchie will forgive me for saying so, I am going to compare the Government to a milch cow. (Laughter.) The major portion of the agricultural prosperity has been attained by the individual enterprise, enthusiasm, and imagination of the farmer. At the same time the farmer can look to his Ministry as his guide, philosopher, and friend, but not as his wet nurse or his milch cow. (Laughter.) I do not know much about these things, but I think to-day the Government milch cow, after a period of very heavy lactation, is just drying off—(laughter)—and you cannot expect any milch cow not to have drying-off periods. But I believe the Government milch cow has lost no quarters. She is full with promise, and I am perfectly convinced that when the next period of lactation comes along she will not forget the one staple industry in the State. There is an immense field for scientific research work in this great industry, and I am delighted to think that those who are responsible for the University of Adelaide have seen fit within the past few weeks to appoint a most distinguished scientist to a lectureship and professorship of zoology. He will, in the course of his duties, roam over the whole field of plant and animal health and disease. That cannot fail to be of immense assistance to the agricultural community, and just as I want the Ministry of Agriculture to be a guide, philosopher, and friend, so I want the University to be the crown of all scientific research work in the State. Our good friend, Mr. Colebatch, in another field, is carrying on a work of tremendous benefit. Nothing has impressed me more, since my arrival here, than the way the farmers rallied to the winter school recently held at Roseworthy College. The Government in England within the past few weeks have allocated £1,000,000 for scientific research work in the interests of the farmers there. The Chairman of this work (Lord Bledisloe) is one of my greatest personal friends. We were students together at the Agricultural College there. We were fellow-members of the House of Commons for more than 10 years. He wrote to me recently to say that if ‘we can be of any use to you in South Australia you have only to command us; and if you, on the other hand, can give us your assistance by an interchange of knowledge and experience, by all means let us do so.’ (Cheers.) I hope it will be possible for us to join hands across 12,000 miles and see whether we cannot exchange views which will be beneficial to both sides.

## THE WORLD'S WHEAT.

"A year ago I convened a thoroughly representative agricultural conference. Every agricultural avenue was explored. The members were charged with the duty of examining certain educational problems and the question of the improvement of livestock. After I had convened and opened it, it obviously passed out of my hands. The conference is still sitting, and has arrived at important decisions, and the Treasurer's announcement will be extremely important. As representing His Majesty in this State, I want to tender my most grateful thanks to the members of this great conference for the services they have rendered, not only to agriculture, but to the State, in a time of trouble in the examination of these great problems. There are few matters to which I can refer without treading on the ground of policy or of administration. If I speak of wheat I am immediately submerged in a whirlpool—(laughter)—but there are one of two fundamental facts which are sometimes forgotten. One of these is that the average output of wheat in the whole world is 107,000,000 tons. Of that great figure only 8,000,000 tons is grown in the southern hemisphere. Yet this is still more remarkable, that one-fifth of the total exportable wheat of the world comes out of that 8,000,000 tons. That means that a very large proportion of the world's population lives on rice, maize, rye, and so on. It gives us this hopeful thought, that the consumption of wheat is certain to increase. Another thing that we need to bear in mind is the extraordinary fact of the tremendous variation in wheat in different countries under different conditions. The yield varies from 8bush. to 40bush. to the acre. We need to give more thought to science in our agricultural activities. We have seen what can be done in the experimental plots at Roseworthy College. If we could only bring our average up to 25bush. or 30bush. to the acre, taking the Commonwealth as a whole, what a different outlook there would be for the wheatgrowers of Australia. Another thing I would like to mention is how valuable it would be if we had a central sieve for all our information on this particular subject. I was delighted to see a similar proposal emanate from the British Empire Producers' Association Convention, recently held in London, and at which three delegates from this State were present. I can conceive of no more valuable work that would stimulate agricultural effort than this move to bring nearer the activities of the old and new worlds.

## AN APPEAL FOR PURE BREEDS.

"Let me say a few words on a subject on which I am a little bit of a crank. We are in the city of culture, but not the city of cattle. (Laughter.) I have heard it said that South Australia is not a cattle country. I disagree with that absolutely and entirely. From what I have seen I believe it can grow anything and everything, but on this subject you need to make up your mind whether you are going to grow cattle for meat or milk, or as is perfectly possible, for both. Due regard, of course, must be paid to climatic conditions, markets,

and transport. I hope I shall not be accused of being presumptuous or dictatorial if I make my remarks as emphatic as possible. We must, in the first place, understand that the cattle which are now here are not indigenous to Australia. They are from Europe, and England is the home of the finest pedigreed cattle the world knows. I have given the greater part of my life to this subject. Never use other than a pure bred sire. (Applause.) There may be instances in which men have got good results for a year or two from crossbreds, but why not have the pure-bred animal which would carry on for all time their qualities of meat and milk? My life's experience and knowledge have shown me that to get the results you must breed from a pure-bred sire, and those who are doing otherwise in this country are doing poor service for the State. (Applause.) Let us assume that we are going to breed for milk. This question of milk production is one that touches the consumer as much as the producer. By a proper process of selection and elimination, through herd testing societies, from a similar number of cows you can double the amount of milk they give. The milk production of the cows of this sunny land could be wonderfully improved, but I do appeal for the adoption of the herd testing scheme, and for proper methods of selection and elimination. The results can be got here. They have been got. I have only to mention the names of Shillabeer, Leslie Cowan, Wood, Angas, Melrose, Arthur Snell, and others to prove this. These men are doing an immense good to the State, and I urge you to support them. I told Mr. Shillabeer the other day, when I was inspecting his herd, that if he could get his Friesian herd to England it would be £20,000 in his pocket. I am not arguing for one breed against another, but I do say stick to a pure breed, and do not diverge one iota from this. In dealing with this matter, we must remember also that alongside of pedigree there must also go performance. I attained my ambition this year when I won not only the Breed Championship in the premier show of the world, but also the milking trials. (Applause.) The credit is not due to me, but to my herdsman. I appeal to you to watch both pedigree and performance. Another matter of importance is a clean health bill. The other day I spoke rather rashly about the health of cattle. Too much notice was taken of what I said; but I was speaking for the future. I want to see the highest ideals taken up in South Australia. As soon as it is possible to apply in this country the acid test that is used in England the better it will be. The last year I was in England nearly the whole of my time was taken up in work on a committee which dealt with the question of the production of milk. We examined the whole question, and also the question of the disease in cattle, and the harm which such disease was causing. The summary of our conclusions in this connection was that there was reason to believe that the dairy herds in England contained a large percentage of animals which would react to the tuberculin test. We suggested that the Government should provide reasonable facilities for carrying out tests, and I would say that we should not be absolutely satisfied until we have clear and abundant evidence that the conditions that apply in the Old Country are not applicable here. I leave this word with you for the future—while building up

your dairy herds, try to see simultaneously that your herds have a clean bill of health.' (Applause.)

Mr. W. S. Kelly moved, and Mr. J. Wallace Sandford seconded, a vote of thanks to His Excellency.

### THE TREASURER'S SPEECH.

#### DAIRY INDUSTRY POSSIBILITIES.

The Treasurer (Hon. G. Ritchie) congratulated the delegates on the growth of the Bureau system, and said that whereas in 1889 there were only 18 Branches, with a total membership of 130, in 1921 there were 216 branches, with a total membership of 5,558. The total number of meetings held last year was 1,338, and the total attendances was 14,826. The members of the Bureau represented the most progressive producing interests in the State. The State's solvency was largely dependent upon effective production. One of the avenues along which they could increase their production greatly was dairying. They could gauge the value of the dairy production by the mean output per cow. In South Australia this did not exceed 312galls. per cow in the 1918-19 season. With the elimination of unsatisfactory cows, and more generous feeding treatment, this mean output could easily be raised to 500galls. per cow annually, and the increased value in milk production without the addition of a single hoof would be £600,000. In order to improve the dairy herds of the State the Government had taken special steps to secure the establishment of herd-testing societies. The first of these had been formed at Murray Bridge. That society included 16 herds, with an aggregate of 300 cows under test. During the eight months for which figures were available the output per cow was over 454galls. of milk, and it seemed probable that over the whole 12 months the society would exceed 600galls. In view of the low general output for the State, this was highly satisfactory. The best herd in the society, with an average of 44½ cows, secured the satisfactory mean yield per cow of 652.4galls. of milk and 246.9lbs. of butter fat. The worst herd in the society, with an average of 19 cows, had yielded 319.8galls. of milk, and 146.7lbs. of butter fat. If the lowest herd copied the practices of the best herd, the result might be highly beneficial to the State. The Agricultural Committee had submitted to the Government recommendations on two important matters. In regard to one of these, the Government had agreed to introduce legislation to provide an annual registration fee on all bulls. They proposed also to provide for an annual sale of pure-bred bulls, the progeny of officially tested cows, and to grant a liberal subsidy to purchasers of such bulls, provided they made the bulls available for service at a moderate fee. In regard to the establishment of an Agricultural High School in the metropolitan area, he believed the scheme submitted by the committee was a good one. Immediately finances would permit, the Government would give most careful consideration to the matter. It would involve considerable expenditure, and at present the Government had not the money. In conclusion the Minister appealed to producers to take more advantage of the olive-growing bonus which the Government had offered.

The Chairman (Mr. C. J. Tuckwell) said he hoped the Government would endeavor next year to provide a larger vote for the Department of Agriculture, that more monetary provision would be made for pruning competitions along the Murray, and that generally the department would not feel so cramped in regard to expenditure. He paid a tribute to the excellent work which had been done during the year by the Secretary (Mr. H. J. Finnis).

*(To be continued.)*

### SPRAYING MIXTURES.

The accepted proportions of ingredients for making the three sprays, viz., lime sulphur, soda, and bluestone—known as Burgundy mixture—and lime and bluestone, or Bordeaux mixture, are given by the Horticultural Instructor (Mr. Geo. Quinn) as follows:—

*Lime Sulphur.*—This compound is made by boiling fresh lime and sulphur together in the proportions of 53lbs. of quicklime, 100lbs. flowers of sulphur, in 50galls. of water. The process is briefly as follows:—The lime and sulphur are placed in a large boiler with half the water and stirred well together with a wooden paddle. Heat is evolved and care to avoid spurting is needed. When the mass is well mixed the remaining half of the water is added, and the whole boiled for about an hour. Stirring is practised at frequent intervals during this period. About a quarter of an hour after boiling commences the mixture froths up freely, hence the need for a boiler of greater capacity than merely to hold the volume given above, and for constant stirring just then. The 50gall. mark made in the boiler can be kept covered by adding small volumes of water from time to time to keep down frothing, and to replace evaporation. When the boiling of the solution is completed and the stock compound cooled it may be diluted as follows:—For winter spraying—1gall. to 7galls. of water; for summer spraying—1gall. to 28galls. of water. The making of this spray is a tedious and disagreeable job, and we have adopted the use of prepared concentrated lime-sulphur compounds now on the market. We have used 1gall. in 70galls. of water as a summer spray for oidium on grapevines, and for Red Mite (*Bryobia*) on fruit trees with equally good results.

*Bluestone and Washing Soda (Burgundy Mixture).*—This is made by dissolving 6lbs. bluestone, 9lbs. washing soda, and diluting with water to 50galls. of spray. The bluestone—as you are probably well aware—is dissolved by being suspended in a piece of bagging just under the surface of the water in a wooden tub or barrel. I like to

dissolve bluestone at the rate of 1lb. in 1gall., and then when dipping out you know you have a pound in each gallon of the solution. The soda is quickly dissolved in hot water. The secret of making good Burgundy or Bordeaux is to dilute all the solutions of bluestone, soda, or limewater greatly before blending them. For instance to make 50galls. of spray pour 6galls. of the bluestone solution into the spray tank or barrel, and dilute it to 25galls. by adding water. Then do the same with the soda or lime in another vessel before pouring and stirring it into the bluestone solution. These dilute solutions make a light, easily-suspended precipitate, readily distributed evenly on to the trees. This point is important.

*Lime and Bluestone (Bordeaux Mixture).*—Take 6lbs. bluestone and 4lbs. of fresh, lumpy quicklime to make 50galls. of spray. Dissolve and dilute the bluestone as described above, slake the lime in another vessel gradually by adding water slowly as heat is evolved, and the lumps crumble. When slaked down add water as described until 25galls. are reached. Then into the diluted bluestone solution pour the strained milk of lime stirring as the solutions meet. If you cannot keep the lime fresh, slake all you have in a barrel and dilute to the proportion of 1lb. in 1gall. or  $\frac{1}{2}$ gall. of water, providing always the water covers the lime for some inches as it settles down. This will keep some weeks and may be stirred up thoroughly before dipping out the required volume to blend with bluestone solutions to make Bordeaux. At any rate do not use mixed Bordeaux after it has been blended, say, 24 hours.

In respect to the use of these compounds on apple trees, I suggest using either the Bordeaux or Burgundy of the respective strengths given above when the pink of the blossoms is freely showing. If—as is usually the case—it is necessary to spray against the fusieladium after the fruit sets, then the summer strength lime-sulphur may be used.

At this stage you will be using lead arsenate against the “Codlin Moth” caterpillars, and it is possible to make a dual purpose spray by mixing the arsenate with the lime-sulphur or either of the other fungicides mentioned. To do this the quantity of arsenate required is brought to a fine, thin, creamy condition by first stirring it into a little water. The lime-sulphur having been made up to the required volume the same as if it were to be used alone—the liquified arsenate of lead is stirred into it, and kept stirred throughout the time whilst the mixture is being applied to the trees.

I may say it is claimed in the adjoining States the lime-sulphur if used after the fruit sets does not russet the apple skin as does the Bordeaux or Burgundy mixtures. Of this I cannot speak from actual tests, but in localities where the air is damp, and dews or light showers are abundant, I can quite believe the constant and rapid liberation of the copper compounds from the Bordeaux or Burgundy mixtures may tend to cauterize the fruit skin, which, under such climatic conditions, remains very soft and tender.

## ORCHARD NOTES FOR THE SOUTHERN DISTRICTS.

[C. H. BEAUMONT, Orchard Instructor.]

The frequent showers of rain will make the work of controlling fungus pests more difficult. The only way to overcome the difficulty is by spraying again and again, until the weather is quite settled. Use Bordeaux mixture every time.

The spraying for codlin moth is the most important work in the orchard, the time to commence is just after the petals have fallen, or in other words, just after the fruit has formed. Spray again in about 10 to 12 days and afterwards every three or four weeks, so as to keep a coat of spray always on the fruit. Use a known brand of arsenate of lead powder, about 1lb. to 30galls. of good water. No other mixture will compare with this in effectiveness.

Red spider will be observed on the blossoms as soon as the warm weather comes, and the best remedy, for the present time, is lime sulphur solution, which may be bought ready for use; 1½galls. in 100galls. of good water is strong enough. Woolly aphis is still troublesome in many orchards. If you notice little lots of it about, do not neglect it, dose it at once with pure kerosine applied with a paint brush. If it is very thick, try kerosine emulsion made by boiling up 1lb. of common soap in 1gall. of soft water, stirring in 2galls. of kerosine and thoroughly mixing. One gallon of this will make 12galls. of spray. Black leaf 40 is a good remedy, but is unreasonably dear. Peach aphis and orange aphis may be treated in the same way.

Downy Mildew.—Vignerons will have to decide about their first spraying this month. The *Journal* for September has all directions in a special article on the subject by Professor Osborn.

Watch for apple root borers, and for apricot and almond borers. Continue to watch for cut worms amongst young vines or trees.

Finish ploughing and cultivating.

## ORCHARD NOTES FOR THE NORTHERN DISTRICTS.

[J. B. HARRIS, Orchard Instructor.]

Probably when this comes under the notice of the general reader, the time for spraying with lead arsenate, i.e., the falling of the petals from the flowers on apple and pear trees, will be at hand. That being so, I propose to write of two matters upon which I have been frequently questioned—the best brand of arsenate lead, and the so-called failure of various brands used last season.

The best brand of lead arsenate is that which most effectively destroys the larvae of the codlin moth (*Carpocapsa pomonella*), and other pests which it is intended to poison, at the proportionately cheapest cost. The chief factor in costs is labor of spraying, which

is constant for either a cheap or dear brand of arsenate, so that a slightly better result may warrant what appears at first sight to be a large increase in cost of material. Those about to spray would do well by referring to the analyses of various brands published in this *Journal* in January, 1921, where particular attention is drawn to the suspension tests.

In the matter of the failure of various brands used last year, this was, in my opinion, due to the inability of the spray to remain on the plants when they were drenched with rain shortly after the application of the spray; apparently all brands were alike in this matter of being washed off. The trouble was not apparent to the uninitiated until the early part of this year when, with finer weather, the moth larvae seemed to increase with alarming rapidity. The damage caused by the grub is not usually very obvious until after Christmas, and this has lead certain persons to adopt and advocate, for a time, the practice of omitting spraying at the time the petals fall. I wish to state emphatically that, in my experience, the omission of the early spray has proved a drastic failure. The few scores of grubs which go unharmed, where early spraying is not practised, live to become progenitors of thousands of a later brood. On the other hand, there are persons who omit the later spraying and this fails to keep the fruit adequately protected by a film of the poison as it grows and the skin area increases. To do this latter it may be necessary to spray five or even six times where early and late varieties are grown, and though it may be argued that, at present prices, such spraying would not pay, a minimum of codlin moths in any district will be a very desirable state of affairs when a return to the export trade improves the market for prime apples and pears.

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## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held on Monday, September 12th, there being present Mr. C. J. Tuckwell (Chairman), Capt. S. A. White, Col. Rowell, and Messrs. F. Coleman, T. H. Williams, W. G. Auld, and the Secretary (Mr. H. J. Finnis).

*Evaporation of Fruit.*—At the recent conference of River Murray Branches a resolution was carried asking the Government to experiment with the evaporation of fruit. The Board submitted the matter to the Horticultural Instructor (Mr. Geo. Quinn), who supplied the following report:—

“As far as I am able to memorise, the discussion which gave rise to this resolution at the Conference of River Murray Branches of the Agricultural Bureau at Waikerie, turned upon the question of experimenting with a view to preventing by applied heat the incubation of insects from fruits evaporated by the ordinary outdoor methods adopted along the river, rather than experiments in the actual dehydration of the fruit itself. I have also some recollection of having promised to endeavor to enlist the interest of the Director of Chemistry (Dr. Hargreaves) in the matter owing to the success achieved by him in the application of heat to weevil-infested wheat to destroy the eggs thereon, prior to its shipment to Europe.

“The evaporation of the moisture from the fruit itself in artificially heated dehydrators is being already experimented upon by growers on the Murray—as witness papers read by Mr. Gerald Beverley, manager of the Pyap Estate, at this as well as a previous Conference. From Mr. Beverley’s data a valuable clue was afforded of how much more a valuable fruit could be saved from the ravages of the dried fruit moth, weevils, &c., if subjected in an evaporator to certain temperatures immediately prior to being boxed up for the warehouse, than if passed directly from the drying ground to the sweat box, and thence through the graders into the commercial packages.

“I will not, therefore, dwell on the question of experiments in the evaporation of fruit as being desired by the Waikerie Conference or the Board, but this very, and to my mind more, important question of preserving the fruit from immediate infestation by these insects after the evaporating process has been completed in the ordinary way. If conclusions may be drawn from the experiences of the growers on the older settlements along the Murray—now exceeding 25 years—the occurrence of bad drying seasons has been so rare that in my opinion the erection and maintenance of a costly evaporating plant by the blocker, or even by a group of blockholders, is not warranted, and that more particularly where distilleries are within carting distance to come to the rescue—as they have done on several occasions—when control of the elements went beyond the precautions available to the average grapegrower, and this year’s crop was in imminent danger of becoming an absolute loss.

“On the other hand, however, the preservation of the already dried article from insidious destruction by insects, whose ova are undoubtedly more often already deposited upon the fruit before it is boxed up, is one of great and crying urgency. This statement is deserving of greater emphasis than ever before in the history of the industry, owing to the fact that our output of dried fruits is rapidly increasing, and the finding and keeping of outside markets becomes of greater moment.

“What in the nature of experiment is needed, in my opinion, first is—(a) To ascertain definitely the species of insects which infest our dried fruits; (b) where these pests first come into contact with such fruits; (c) the range of degrees of heat which will destroy the egg, larva, and complete insect, but at the same time not affect the flavor or keeping quality of the dried fruit. I have not mentioned experiments in disinfection by means of noxious gases. I have had some experience with the more commonly accepted forms of these, and whilst for some pests one or other of them is effective, they are in most instances surrounded by a definite element of danger, either due to their extremely poisonous or explosive characteristics.

“Once the principle of sterilization of the dried fruit by heat—and whether such heat should be applied in a dry or moist condition—is placed on a thoroughly definite basis, no doubt some inventive mind will come forward with a contrivance whereby this sterilization may be achieved rapidly. Whether it should precede or follow immediately upon the grading process, I leave to practical men to decide, but the processes seem under the circumstances to be almost equally essential. I cordially invite the co-operation of the Advisory Board in the direction of securing this desirable achievement.”

On the motion of Mr. F. Coleman, seconded by Mr. T. H. Williams, the Board decided to ask the Minister to give instructions for steps to be taken to investigate the problem.

*Removing Kangaroos from the List of Protected Animals.*—Some little time ago a request was received from the Netherton branch asking that kangaroos might be removed from the list of protected animals in their district. The question was submitted to the Chief Inspector of Fisheries and Game, who mentioned that the season for the taking of kangaroos had recently been altered. The animals were now protected between October 1st and March 31st. Farmers and others should now be able to keep these animals in check. The Secretary was instructed to advise the Branch.

*Instructional Course at Berri Orchard.*—The recent Conference of River Murray Branches carried the following resolution:—“This Conference is of the opinion that if there was a short course of instruction at the Berri Experimental Orchard for horticulturists, more growers would take the opportunity of attending same who cannot attend the Roseworthy Agricultural College.” The Horticultural Instructor (Mr. Geo. Quinn), to whom this matter was referred, supplied the following report:—“The desirability of initiating a short course of theoretical lectures and practical demonstrations in fruit culture at the State experimental orchard at Berri for the benefit of the new soldier settlers on the irrigated areas was warmly advocated, and that

with considerable force by several of the soldier settlers themselves who attended the Waikerie Conference. They claim they did not go to the short course at Roseworthy, firstly, because of the expense involved, and, secondly, that irrigated fruit culture could not be dealt with there in a manner which would appeal to them. 'What we claim,' they announced, 'is that whilst we can undoubtedly gather valuable ideas by copying the practices of some of the older established blockers in the areas adjoining, we are still working more or less by rule of thumb, and as younger blockers we want to be grounded in the theoretical principles underlying the operations we conduct from time to time in our orchards and vineyards. We wish to know why certain things are done, and that knowledge, if obtained, will enable us to work more intelligently and avoid many of the past and probably present errors of our older established neighbors.'

'I wish to add such argument is to my mind unanswerable, and one could wish it were possible to acquiesce at once in the wishes of those who brought forward the resolution. The facts, however, are these:—Roseworthy College is an educational centre equipped with a staff and conveniences specially designed for its purpose. The adaption of these to short courses of instruction may be achieved within a reasonable time, and without much more than an ordinary effort on the part of those most intimately concerned, but Berri Experimental Orchard, on the other hand, has absolutely no more equipment than could be found on any reasonably well established river block owned by a private fruitgrower. With the exception of the manager no one is employed there possessing a knowledge of the 'theoretical principles' underlying the various phases of fruit culture. It will be seen, therefore, that the request of our soldier settlers cannot be complied with, without the expenditure of a considerable amount of money on buildings, and equipment, and the diversion of the manager's attention from the duties for which he has been especially trained, and which now call for more than the whole of his time.

'My sympathies are wholly with these young soldier settlers, and I take the liberty of presenting another aspect of this question of horticultural instruction, which—in my opinion—is more directly applicable to their present needs than that contained in their own request. It is also—in my opinion—likely to extend its benefits to a greater number than would be handled through short courses at the Government Experimental Orchard. It is as follows:—That a competent itinerant instructor be appointed to devote the whole of his time to the instruction of these new settlers, such instruction to be given on the block of each one. The type of instructor required is one who has been trained in the principles underlying horticultural practices, the treatment of pests and diseases, and fruit technology generally with a special knowledge of vinegrowing, and fruit culture, and fruit manipulation as carried on in the Murray Valley. Such an instructor to prove successful must also be temperamentally equipped for imparting his knowledge to beginners who will naturally present a very wide range of capacity for assimilating such information.

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"It must be borne in mind that the greater proportion of these soldier settlers, though strikingly enthusiastic, are quite inexperienced in the calling they have adopted. During the recent visit paid to the Glossop and Cadell settlements, it was very patent to me that one objection I had raised, as a member of the Soldier Land Settlement Qualification Committee, against granting qualification certificates to enable insufficiently trained men to go on to irrigation blocks was being verified, and would result in loss and disappointment unless a supervising and guiding hand be ever ready from the outset to indicate the best course to pursue in cultivating the land, training, and caring for vines and trees, handling the irrigation water, and arranging for setting apart a suitable space for the manipulation of the produce in the near future.

"An instructor moving constantly amongst these settlers would soon learn of the needs of each, and more particularly of the less apt, and thus devote special attention to helping them to avoid many preliminary errors. In my opinion, if the best qualified man could be installed in such a position for several years, his efforts would do more to raise the average standard condition of the work done on the blocks than any system of short courses of instruction, which must fail to reach the greater proportion of the settlers. The wideawake and progressive would secure the advantages of the short course, whilst on the other hand the settler of average or even lower aptitude and initiative would be reached by the itinerant instructor."

Col. Rowell moved, and Capt. White seconded:—"That a recommendation be sent on to the Government, that steps should be taken to carry out the proposal of the Horticultural Instructor."

*Testing Life of Timber Posts.*—The Petina Branch asked that experiments might be conducted at the Minnipa Experimental Farm to ascertain the life of different timbers for fencing posts. On being asked to supply a list of the timbers that would prove the most suitable for the experiment, the Petina Branch forwarded the following names of timbers:—Ti-tree, Kong, Red, Black, and White Mallee, and Native Pine. The secretary was instructed to forward the communication to the Director of Agriculture.

*Manufacture of Drainage Pipes.*—The following resolution was carried at the 1921 Conference of River Murray Branches:—"That the Government be asked to take steps to facilitate the making of drainage pipes at Berri and Cobdogla." The matter was forwarded to the Minister of Irrigation, who stated that the Director of Irrigation advised that two local firms had decided to go in for the manufacture of drainage pipes, and the Minister had, therefore, instructed the Director of Irrigation that in the circumstances the department could not compete with private enterprise in the matter.

*Refrigerating Car for Eyre Peninsula Railways.*—At the last Conference of Eyre Peninsula Branches a resolution was carried asking the Government to provide a refrigerating car for the carriage of perishable goods during the summer months. The Secretary (Mr. H. J. Finnis) reported that all Branches concerned in the matter had been circularised, asking the benefits that were likely to be derived

from the refrigerating car. Only six Branches had expressed an opinion, and there was a diversity of opinion amongst these on the matter. Therefore the Board decided to take no action.

*Construction of Tanks on Eyre Peninsula.*—The Board decided to hold the matter of the construction of tanks on Eyre Peninsula over until next Board meeting.

*Library for Agricultural Bureaux.*—The Renmark Branch asked that a complete set of the Bulletins and Reports of the Department might be sent to Renmark, as the Branch intended opening an agricultural reference library. The Secretary reported that a complete set of Bulletins and Reports had been forwarded to the Branch.

*Continuation of River Pruning Competitions.*—Communications were received from the River Branches asking that the pruning competitions as carried out in June last be continued.

*Advances to Settlers for Fallowed Land.*—The Nunkeri and Yurgo Branch asked that the Government should make advances on areas fallowed. The resolution was submitted to the Commissioner of Crown Lands, who intimated that it was not proposed to introduce legislation for the above-mentioned purpose. The Secretary was instructed to advise the Branch of this decision.

*Duty on Sulphuric Acid.*—A resolution was received from the Yeelanna Branch objecting to a duty being imposed on sulphuric acid. The Secretary was instructed to notify the Branch that the Board considered the matter one of a political nature.

*Control of Wheat Market.*—The Petina Branch resolved—"That the farmers of the Petina district deplore the fact that the Government has decided to revert back to the old system of wheat trading in South Australia, and we claim that what is known as normal trading is merely another form of control, viz., merchant control; and we ask that this vital question be again considered, and that a ballot be taken among the farmers who contributed wheat to the 1920-21 Pool, and thereby ascertain the wishes of the majority; and we respectively suggest that the ballot papers should enable the voters to mark their opinion as to either a compulsory or voluntary pool or a pool controlled by farmers' representatives, with a Government chairman on the Board." The Secretary was instructed to advise the Branch that the Board considered the matter to be of a political character.

*Protection of Quail.*—At a recent meeting of the Virginia Branch a resolution was carried, urging that the quail be totally protected. On the motion of Capt. White, seconded by Mr. F. Coleman, the Secretary, was instructed to inform the Branch that the bird could be protected by farmers proclaiming their holding sanctuaries.

*Removal of Crane and Trucking Yards.*—A communication was received from the Geranium Branch expressing indignation at the removal of the crane at the local railway station, and also the threatened dismantling of the trucking yards. The Board decided to communicate the letter to the Railways Commissioner.

*Teaching Bookkeeping in State Schools.*—The Redhill Branch asked that steps might be taken to teach a simple form of book-

keeping in State schools. This matter had previously been dealt with by the Education Department, the then Director intimating that book-keeping was beyond the ordinary primary school child. It seldom became intelligible to any one under the age of 14 years. After that age a boy would be likely to benefit by instruction. It was decided to inform the Branch of this opinion.

*Amendment of the Fencing Act.*—The following amendment of the Fencing Act was suggested by the Gawler River Branch:—"That the portion (half) of the fence on the right hand side of the adjoining landholders, when they stand each on his own property and facing each other, be under the care of those respective landholders." The Secretary was instructed to bring the matter under the notice of the Lands Department.

*Railway Demurrage Charges.*—The following resolution was received from the Narridy Branch:—"That notices of the arrival of goods be sent by station masters to consignees living at a distance from the line." It was decided to advise the Branch to communicate with the Railways Commissioner.

*Break of Journey on Excursion Railway Tickets.*—The following resolutions were carried at the Conference of Pinnaroo Line Branches:—(a) "That the Railways Commissioner be requested to so issue all excursion tickets from any long distances to enable passengers to break the forward journey within reasonable suburban areas." The Board decided to forward the matter to the Railways Commissioner, with a request that steps should be taken to give effect to the resolution. (b) *Losses from Take-all.*—"That this Conference brings under the notice of the Advisory Board that take-all causes great losses, and that steps should be taken to seriously consider some means of overcoming the trouble." It was decided to ask the Director of Agriculture for a report on the question. (c) *Opening of a Southern Port.*—"That this Conference favors the establishment of a southern port as an outlet for Murray Land produce." The resolution was received. (d) *Bulk Weighing of Wheat.*—"That this Conference favors the bulk weighing of wheat in preference to the single bag system. The Secretary was instructed to refer the resolution to the Minister controlling the Wheat Scheme. (e) *Veterinary Lectures and Demonstrations.*—"That this Congress favors a series of lectures and demonstrations along the Pinnaroo line by Government veterinary surgeons." On the motion of Capt. White, seconded by Mr. F. Coleman, it was decided to transmit the matter to the Minister of Agriculture, with the strong recommendation of the Board.

*Simplification of Income Tax Returns.*—The Conference of Southern Branches resolved—"That the Government be recommended to simplify the income tax returns for farmers." The resolution was received.

*Immigration Conference.*—A communication was received from the State Immigration Officer (Mr. V. H. Ryan) asking that two members might be appointed to represent the Advisory Board at a Conference convened by the Hon. the Commissioner of Crown Lands to give consideration to the matter of according to new settlers a suitable

welcome and facilitating their ready absorption into the general life of the community. On the motion of Mr. Coleman it was decided that the Secretary (Mr. H. J. Finnis) should be one delegate, and that officer should arrange with some other member to attend the Conference and represent the Board.

*New Branch.*—An intimation was received from Mr. R. Woodrup, of Pygery, seeking the sanction of the Board to open a Branch of the Bureau in that district. As there was a distance of only four miles between Pygery and Wudinna, where there was at present a Branch, the Secretary was instructed to make fuller inquiries in relation to the district and the prospects of the proposed Branch during his visit to Minnipa to attend the forthcoming Eyre Peninsula Conference.

*Next Meeting.*—It was decided that the next meeting of the Board should be held on Monday, October 17th.

*New Members.*—The following names were added to the rolls of existing Branches:—Penola—S. Cortell, E. L. Russell, E. Curgenvven, E. Kidman; Younghusband—Pobke, H. M. Gawhing, J. Gawhing; Carrow—T. Burt, W. L. Reed, R. Kemp, jun.; Cradock—R. Turner; Naracoorte—A. H. Butler, R. E. Fisher, T. A. Williams; Geranium—E. Geytenbeek, J. Bridgeman, French, jun., J. Chambers; Port Broughton—H. W. Whittaker, W. M. Wall; Rendelsham—V. C. Slee, H. Sly, F. Todd, jun.; Moonta—J. Verran, B. Jolly; Lenswood and Forest Range—R. Hackett, jun.; Rockwood—K. E. Smith, G. F. Rogers; Wudinna—A. Rowley; Cadell—X. Thomas, L. H. Hoffman; Yaninee—G. A. R. Scholz; Narridy—D. Rabbett, A. G. Atkinson; Berri—E. V. Cox; Mount Gambier—J. Fletcher, jun.; Parilla—J. Gregor, C. Kerley, C. S. Foale; Moorook—R. Curtis, A. McGregor, E. Liddicot, A. E. Matthews; Williamstown—S. S. Woolford, L. Whiteman, P. Millington, S. Cundy, F. Bain, A. W. Holmes; Netherton—A. E. Isaacson; Watervale—F. Grace, L. Baker, F. W. Wholfeil; Warcovie—N. W. Crossman; Nantawarra—G. Herbert; Laura—J. Watt; Arthurlton—H. Graham; Brentwood—J. Duncan, R. Longbottom, J. Honnor, jun, R. Johncock; Red Hill—R. B. Scholefield, F. C. Beech; Hawker—E. A. Pumpa; Wilkawatt—T. Sorrell; Morphett Vale—R. G. L. Poidevin; Lyndoch—R. M. Wilson; Carrow—W. Robins; Clare—H. W. Lawrence, —Dolan, J. Miller, J. Hamlyn; Strathalbyn—G. Cross, R. Piper, J. T. Kerslake; Renmark—S. W. J. Richardson, G. Martin, T. J. Keppell, C. A. Ritchie; Yallunda—H. Butler; E. Butler, W. Ahang; North Booborowie—E. J. Dawson, L. G. White, F. Giles, D. Craige, H. A. Storr, C. Mayfield; Balhannah—E. Boehme, W. Rahlbusch; Maltee—J. O. Shorne, E. D. Barnett, W. W. Barnett, J. W. Barsham, H. J. Schwarz, C. G. Schwarz, R. Edson, L. M. Martin, J. B. Talbot; Elbow Hill—R. E. Gribble; Wollowa—V. L. Sullivan, F. Rush, J. Rush, J. Saby; Miltalie—F. Jacobs; Amyton—F. Bunfield, J. Ward, A. Garnett, W. Aslop; Kingston-on-Murray—J. Kennedy, R. Antony, J. R. McLaren; Waikerie—J. Wuttke, J. Marden, R. G. Thompson, E. P. M. Shaw, H. Leaney; Dowlingville—R. L. Mason, G. W. Mason; Lameroo—W. R. G. Sharp, A. J. Barr; Hawker—F. C. Groch, W. J. V. Sweet, E. J. Pumpa, J. F. Pumpa, A. J. White; Maitland—W. Bayly, P. G. Bowey; Williamstown—M. Rich, C. P. Harvey.



## THE AGRICULTURAL OUTLOOK.

## REPORTS FOR THE MONTH OF SEPTEMBER.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

**Booborowie**.—Weather—On several occasions the wind was exceedingly strong, and blew over trees, and also broke off many limbs; 280 points of rain were registered for the month up to the time of writing. Crops—These are now making good growth, and dandelions are worse than they have been for at least three years. Natural feed is very plentiful. Stock are all in good condition, generally speaking. Pests—Rabbits are rather numerous, and the stemless horse thistle, if not checked this year, will have a good chance of overrunning this neighborhood. Miscellaneous—Shearing in most cases is finished, and farmers are busily engaged working fallow land.

**Eyre Peninsula**.—Weather—Generally dry; 68 points of rain for the month, scattered over five days. Some exceptionally strong gales, which caused considerable damage. Crops—Early sown crops doing well and out in ear. Later sown crops badly in need of rain, although the few points this month have made a wonderful difference to these crops. Red rust fairly prevalent. Natural feed is drying off quickly, there being a wonderful growth of it. Stock are all in good condition, and free from disease. Pests—Rabbits are numerous, it having been necessary to poison. Grasshoppers are putting in an appearance. Miscellaneous—Haycutting should commence next week. Stone fruits and vines are commencing to look green with foliage.

**Turretfield**.—Weather—The weather this month has been very suitable; the rainfall of 291 points was needed for the late-sown crops. Heavy rain with thunderstorms and hurricane winds have been experienced on several occasions. Crops have improved wonderfully, and good cuts of hay will be made on many farms. The yield of barley should be good. The vines will benefit greatly by the soaking rains of this month. Natural feed is plentiful, and the good rains gave it a fresh start wherever it was eaten off. Stock is in good condition; sheep are looking wonderfully well. Pests—The lucerne flea has not gone, and is still doing a certain amount of damage. Miscellaneous—Shearing is being carried on. Cultivation of fallows and vineyards are being pushed along. Some farmers have not yet finished fallowing.

**Veitch**.—Weather.—Have experienced good rains, having had 154 points to date. Veitch average for same month, 168 points. Have had a few days of very strong wind. Crops generally are looking equal to last year. All early sown is showing a nice length of straw, and the last rain has brought the late-sown crops on wonderfully well. Natural Feed—Enough to keep stock going in good healthy condition. Stock—All doing well. Pests—Rabbits are to be seen. Blowflies are troublesome with sheep. Miscellaneous—Scrub rolling is in full swing. Fallowing operations are finished. Shearing work is in progress.

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**DAIRY AND FARM PRODUCE MARKETS.**

A. W. Sandford & Co., Limited, reported on October 1st, 1921:—

**BUTTER.**—Owing to the depressed state of the London butter market and the absence of buyers, values throughout the Commonwealth have slumped considerably. Unfortunately, the Imperial Government is carrying over something like 30,000 tons of butter from last season, which is demoralising the market, and although exceedingly low prices have been offered to London, buyers do not accept owing to the uncertainty of the position. At the close of the month values were:—First grade factory and creamery, in prints, 12½d. to 13d.; best separators and dairies, 12d. to 13d.; fair quality, 10d. to 11d.; store and collectors', 9d. to 10d.

**EGGS.**—Rates in this line have kept up very well during the month considering the heavy supplies that have been coming forward. Picklers and pulp manufacturers have been taking the surplus, and this has had the effect of keeping the market nicely cleared, values now being fresh hen, 10d.; duck, 10½d.

**CHEESE.**—Prices have come back in sympathy with the value of butter, and as Western Australia is over-supplied with Queensland cheese, buyers are not operating, so that stocks have accumulated, present prices being 7½d. to 8d. for large to loaf.

**HONEY.**—The demand is exceptionally slow, and even at this lower rate buyers are not operating. Prime clear extracted is being quoted at 4d.; second grades, 2½d. Beeswax saleable at 1s. 9d.

**ALMONDS.**—The supplies coming forward are not nearly equal to trade requirements. Stocks are very light, and consignments are meeting with ready quittance at:—Brandis, 12½d.; mixed softshells, 11½d.; hardshells, 5d.; kernels, 2s. 1d.

**BACON.**—Rates ruling for the live animal are much easier, and in consequence prices of bacon are lower. The lowering in prices has increased the demand, so that heavier quantities are being put through, best factory cured sides selling at 13d. to 13½d.; hams continue slow of sale at 1s. 3d. Lard in packets, 8½d.; bulk, 8d.

**LIVE POULTRY.**—Purchasers have experienced great difficulty throughout the month in obtaining anything like their trade wants, quantities coming forward not being equal to the demand. This has had the effect of firming values, and good prices are likely to rule for some considerable time, so that farmers will be wise in sending on all their surplus poultry. Prime roosters, 4s. 6d. to 6s. 3d.; nice conditioned cockerels, 3s. 6d. to 4s. 5d.; plump hens, 4s. 3d. to 5s. 6d.; light birds, 3s. 3d. to 4s. 2d.; couple pens weedy sorts lower; ducks, 3s. 3d. to 6s.; geese worth 8s. to 8s. 9d.; turkeys, prime-conditioned, 1s. to 1s. 4d. per lb., live weight; fair-conditioned, 10d. to 11½d.; fattening sorts lower. Pigeons, 1s. 2d. to 1s. 3½d. each.

**POTATOES.**—Market has shown very little fluctuation during the month, but locally grown new potatoes are now coming forward in small lots, and it is expected that early next month Western Australia will be offering. Market price to-day for old potatoes is £7 to £8 per ton on rails Mile End.

**ONIONS.**—Values are £5 to £6 per ton on rails, Mile End; £2 to £2 10s. per ton in 3-ton lots on rails, Mount Gambier.

## EGG-LAYING COMPETITION, 1921-1922.

HELD AT THE PARAFIELD POULTRY STATION, PARAFIELD, UNDER THE DIRECTION  
OF D. F. LAURIE (GOVERNMENT POULTRY EXPERT AND LECTURER).

Total No. of Pens.—Section I., Light Breeds (Single Testing), 24—3 pullets in each entry. Section II. Heavy Breeds (Single Testing), 13—3 pullets in each entry. Section III., Light Breeds, 25—6 pullets in each pen. Section IV., Heavy Breeds, 9—6 pullets in each pen.

TWELVE MONTHS' TEST. TO START ON MARCH 1st, 1921, AND TO TERMINATE ON FEBRUARY 28th, 1922.

## SECTION 1.—LIGHT BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENTRY.

Row No.	Name and Address.	Bird No.	Month ending 30/9/21.	Score to Date.	Bird No.	Month ending 30/9/21.	Score to Date.	Bird No.	Month ending 30/9/21.	Score to Date.
WHITE LEGHORNS.										
E	Bamford, W. H., 74, Adelaide Road, Glenelg	1	22	118	2	23	117	3	21	81
E	Connor, D. C., Gawler .....	4	23	87	5	20	91	6	*	*
E	Willington, Mrs. G., Milang ....	7	21	103	8	14	48	9	15	95
E	Nancarrow, J. T., Plympton ....	10	22	64	11	18	60	12	18	82
E	Broadview Poultry Farm, Seaton Park	13	18	87	14	18	79	15	18	76
E	Stevens, H. J., Broken Hill.....	16	24	61	17	14	63	18	1	74
E	Monkhouse, A. J., Woodside.....	19	—	37	20	20	86	21	16	108
E	Turvey, D. J., Milang .....	22	23	63	23	23	61	24	20	46
E	Lampert, Mrs. S., Piccadilly ....	25	22	74	26	24	72	27	20	45
E	Nancarrow, J. T., Plympton ....	28	24	90	29	20	88	30	17	76
E	Small, E. W., Mount Gambier ...	31	21	80	32	20	84	33	15	60
E	Coleman, A. C., Grange .....	34	19	72	35	*	*	36	17	77
E	Broadview Poultry Farm, Seaton Park	37	23	91	38	13	70	39	23	75
E	Holmes, F. A., Naracoorte .....	40	14	57	41	22	78	42	21	83
E	Lampert, Mrs. S., Piccadilly ....	43	21	116	44	*	*	45	25	72
E	Green, F. W. H., Monteith .....	46	18	55	47	17	91	48	12	53
E	Howie, H. H., Mount Gambier ..	49	18	78	50	22	70	51	18	72
E	Willmott, H. J., Clarence Park ...	52	16	51	53	10	33	54	*	*
E	Stockman, A., Goodwood .....	55	18	82	56	*	*	57	17	45
E	Green, A. J., Crystal Brook .....	58	15	86	59	14	72	60	19	96
E	Herbert, C., Alberton .....	61	17	44	62	24	81	63	21	71
E	Blake, Mrs. B. L., Berowra, N.S.W.	64	Dea d	65	20	96	66	25	79	
F	Tilly, P. N., Balwyn, Victoria ...	1	24	76	2	*	*	3	*	*
F	Dugan, T., Lower Light .....	4	21	117	5	24	111	6	18	109
	Totals .....	—	444	1,789	—	380	1,551	—	377	1,575

## SECTION 2.—HEAVY BREED (SINGLE TESTING). THREE PULLETS EACH ENTRY.

## BLACK ORPINGTONS.

F	Lampert, Mrs. S., Piccadilly ....	7	*	*	8	*	*	9	19	127
F	Shaw, R. R., Crystal Brook .....	10	26	73	11	*	*	12	*	*
F	Farr, K. H., Fullarton Estate....	13	23	131	14	27	132	15	16	92
F	Alford, T., Broken Hill .....	16	*	*	17	*	*	18	27	162
F	Lampert, Mrs. S., Piccadilly ....	19	*	*	20	21	137	21	Dea d	
F	Holmes, F. A., Naracoorte .....	22	27	78	23	4	72	24	27	75
F	Shaw, R. R., Crystal Brook .....	25	20	66	26	24	60	27	19	38
F	Wheaton, S. P., Bute .....	28	27	102	29	29	78	30	25	65
F	Bansemer, Mrs. B., Beaumont ...	31	*	*	32	*	*	33	*	*
F	Farr, K. H., Fullarton Estate....	34	24	148	35	*	*	36	24	147
F	Mortimer, G., Broken Hill .....	37	23	134	38	28	124	39	*	*

\* Failed under Regulation 12.

**SECTION 2.—HEAVY BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENTRY.**

Row No.	Name and Address.	Bird No.	Month ending 30/9/21.	Score to Date.	Bird No.	Month ending 30/9/21.	Score to Date.	Bird No.	Month ending 30/9/21.	Score to Date.
<b>RHODE ISLAND REDS.</b>										
F	Stockman, A., Goodwood .....	40	*	*	41	19	72	42	23	55
F	Tester, G., Naracoorte .....	43	*	*	44	25	59	45	23	31
	<b>Totals .....</b>	—	170	732	—	177	734	—	203	792

**SECTION 3.—LIGHT BREEDS (PEN TESTS). SIX PULLETS IN EACH PEN.**

Pen No.	Name and Address.	Breed.	Eggs Laid for Month Ending 30/9/21.	Total Eggs Laid from 1/3/21 to 30/9/21.
1	Anderson, S., Gawler Railway .....	White Leghorns .....	133	652
2	Pugsley, A., Hindmarsh .....	" .....	55	336 †
3	Connor, D. C., Gawler .....	" .....	134	550
4	Willington, Mrs. G., Milang .....	" .....	126	503
5	Norton Bros., Seaton Park .....	" .....	119	444
6	Nancarrow, J. T., Plympton .....	" .....	116	405
7	Small, E. W., Mount Gambier .....	" .....	119	536 †
8	Buchan, J. S., Seaton Park .....	" .....	135	627
9	Anderson, J., Prospect .....	" .....	124	424
10	Pugsley, A., Hindmarsh .....	" .....	85	400
11	Alford, T., Broken Hill .....	" .....	*	*
12	Pool, F. J., North Norwood .....	" .....	139	465
13	Nancarrow, J. T., Plympton .....	" .....	139	596
14	Smith & Gwynne, Gawler South .....	" .....	135	552
15	Ratten, C. A., Mile End .....	" .....	126	595
16	Howie, H. H., Mount Gambier .....	" .....	139	655
17	Willmott, H. J., Clarence Park .....	" .....	104	379
18	Anderson, Wm., Kapunda .....	" .....	118	593
19	Herbert, C., Alberton .....	" .....	132	519
20	Sparrow, F. H. L., late A.I.F., Beverley .....	" .....	121	613
21	Clee Hill Stud Poultry Farm, Box Hill, Victoria .....	" .....	122	536
22	Beythein, E. W., Scott's Creek .....	" .....	130	501
23	Provis & Sons, W., Tumby Bay .....	" .....	133	576
24	Dugan, T., Wingfield Rifle Range, Port Adelaide .....	" .....	130	541
25	Bansemmer, Mrs. B., Beaumont .....	" .....	146	735
<b>Totals .....</b>			2,960	12,733

**SECTION 4.—HEAVY BREEDS (PEN TEST). SIX PULLETS EACH ENTRY.**

26	Lampert, Mrs. S., Piccadilly .....	Black Orpingtons .....	122	562
27	Farr, K. H., Fullarton Estate .....	" .....	136	570
28	Bansemmer, Mrs. B., Beaumont .....	" .....	—	—
29	Farr, K. H., Fullarton Estate .....	" .....	136	670
30	Lampert, Mrs. S., Piccadilly .....	" .....	*	*
31	Alford, T., Broken Hill .....	" .....	*	*
32	Clee Hill Stud Poultry Farm, Box Hill, Victoria .....	" .....	84	709
33	Lampert, Mrs. S., Piccadilly .....	" .....	109	819
34	Ryan, Jas., Coburg, Victoria .....	Rhode Island Reds .....	125	821
<b>Totals .....</b>			712	4,151

\* Failed under Regulation 12.

† One bird dead.

## DIVISION B.—STANDARD BREEDS ONLY.

19 Pens each of 6 Birds—114 Birds.

COMMENCING APRIL 1ST, 1921. TERMINATES FEBRUARY 28TH, 1922.

Pen No	Name and Address.	Breed.	Eggs Laid for Month Ending 30/9/21.	Total Eggs Laid from 1/4/21 to 30,9/21.
37	*Lampert, Mrs. S., Piccadilly .....	White Leghorns.....	—	—
38	*Newcombe, E. G., Alberton .....	" .....	—	—
39	Packham, C. D., Kensington Park...	" .....	123	399
40	*Beythien, E. W., Scott's Creek.....	" .....	—	—
42	Packham, C. D., Kensington Park...	" .....	118	413
43	*Newcombe, E. G., Alberton .....	" .....	—	—
44	Belmont Orpington Yards, Evandale.	Black Orpington .....	135	541
45	*Lampert, Mrs. S., Piccadilly .....	" .....	—	—
46	*Farr, K. H., Fullarton Estate.....	" .....	—	—
47	Bansemmer, Mrs. B., Beaumont .....	" .....	139	615
48	Addison, Mrs. A. L., Malvern .....	Rhode Island Red....	125	476
49	*Beer, A. C., Gilberton .....	" .....	—	—
50	Hill, H. V., West Adelaide .....	" .....	95	440
51	*Beer, A. C., Gilberton .....	" .....	—	—
52	Perkins, C. W., North Norwood .....	Silver Wyandotte ....	116	510
53	Addison, A. L., Malvern .....	White Wyandotte ....	80	340
54	Bagshaw, W. E., Hermitage .....	White Rocks .....	91	424
55	Bagshaw, W. E., Hermitage .....	Barred Rocks.....	111	352
Totals .....			1,133	4,510

† Not in accordance with standard.

## IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC.

During the month of August, 1921, 16,989bush. of bananas, 4 bush. of oranges, 835bush. of pineapples, 116bush. of passion fruit, 150 packages of coconuts, 29,209 bags of potatoes, 834 bags of onions, 16 packages of bulbs, 117 packages of trees and plants, 38 packages of seeds, and 2,010 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910. Of these, 36 bush. of bananas (over ripe) and three bags of potatoes were destroyed; 72 packages of trees and plants and 25 wine casks were fumigated.

Under the Federal Commerce Act, 1,419 packages of fresh fruit, 6,843 packages of citrus fruit, 10,346 packages of dried fruit, 1,907 packages of preserved fruit, and 5 packages of plants were exported to overseas markets. These were consigned as follows:—To London—3,401 packages of citrus fruit, 6,661 packages of dried fruit, 1,882 packages of preserved fruit. To South Africa—587 packages of dried fruit, 25 packages of tomato sauce, and 1,370 packages of apples. To China—59 packages of dried fruit. To India—19 packages of dried fruit, 49 packages of apples, 5 packages of plants, and 400 packages of citrus fruit. To New Zealand—3,020 packages of dried fruit, and 3,042 packages of citrus fruit.

Under the Federal Quarantine Act, 1,811 packages of seeds, &c., were examined and admitted from overseas sources.

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of September, 1921, also the average precipitation to the end of September, and the average annual rainfall.

Station.	For Sept., 1921.	To end Sept., 1921.	A'v'ge. to end Sept.	A'v'ge. Annual Rainfall	Station.	For Sept., 1921.	To end Sept., 1921.	A'v'ge. to end Sept.	A'v'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.					LOWER NORTH—continued.				
Oodnadatta .....	0.17	7.67	3.65	4.73	Spalding .....	2.52	19.40	15.91	20.18
Marree .....	0.42	4.79	4.50	6.02	Gulnare .....	2.10	17.72	15.03	18.97
Farina .....	0.06	5.60	5.06	6.57	Yacka .....	2.00	16.72	12.27	15.27
Copley .....	0.07	7.97	6.59	8.30	Koolunga .....	1.42	16.91	12.56	15.73
Beitana .....	0.10	8.73	6.91	8.93	Snowtown .....	2.25	18.49	13.02	15.87
Blinman .....	0.54	10.27	9.96	12.52	Brinkworth .....	1.50	15.51	13.06	15.91
Taroona .....	—	12.96	5.63	7.33	Blyth .....	1.74	19.28	13.45	16.55
Hookina .....	0.35	16.96	10.10	12.65	Clare .....	3.10	24.49	19.95	24.47
Hawker .....	0.68	19.13	9.92	12.37	Mintaro .....	3.23	22.00	18.84	23.07
Wilson .....	0.53	18.76	9.51	11.85	Watervale .....	3.73	23.42	19.01	27.48
Gordon .....	0.72	22.37	8.23	10.43	Auburn .....	3.23	22.87	19.58	17.82
Quorn .....	1.28	22.12	11.04	13.79	Hoyleton .....	2.48	16.51	14.14	15.82
Port Augusta .....	0.56	17.66	7.36	9.42	Balaklava .....	1.63	14.49	12.57	13.14
Port Augusta West .....	0.58	17.07	7.38	9.36	Port Wakefield .....	1.25	15.84	10.73	13.54
Bruce .....	0.79	17.60	7.08	9.99	Terowie .....	1.33	16.41	10.40	13.97
Hammond .....	1.00	25.43	8.92	11.36	Yarowie .....	2.05	17.75	10.97	13.54
Wilmington .....	2.25	17.50	14.51	18.06	Hallett .....	2.59	17.73	12.77	16.28
Willowie .....	1.34	26.01	11.45	11.82	Mount Bryan .....	2.43	18.72	13.10	16.38
Melrose .....	3.40	20.56	18.79	23.11	Burra .....	2.62	19.81	14.42	17.91
Booleroo Centre .....	1.72	18.86	12.21	15.51	Farrell's Flat .....	2.51	19.19	15.22	18.87
Port Germein .....	1.31	20.33	9.86	12.65	WEST OF MURRAY RANGE.				
Wirrabara .....	3.97	19.08	15.70	19.44	Manoora .....	2.47	18.36	14.74	18.54
Appila .....	1.87	21.73	11.04	14.90	Saddleworth .....	2.15	17.67	15.80	19.75
Cradoek .....	0.29	18.73	8.54	10.82	Marrabel .....	2.12	20.34	15.67	19.44
Carrieton .....	1.11	22.06	9.72	12.34	Riverton .....	3.48	17.56	17.61	20.74
Johnburg .....	1.00	17.30	7.99	10.22	Tarlee .....	3.00	15.21	14.04	17.86
Eurelia .....	1.18	20.77	10.37	13.11	Stockport .....	2.71	16.93	12.88	16.36
Orroroo .....	1.17	19.65	10.54	13.42	Hamley Bridge .....	2.11	15.23	13.12	16.52
Nackara .....	0.85	18.84	8.75	10.63	Kapunda .....	2.45	16.76	15.88	19.85
Black Rock .....	1.42	14.65	9.74	12.29	Freeling .....	2.72	14.29	14.19	17.95
Ucoita .....	0.73	14.05	9.21	11.65	Greenock .....	3.88	18.68	17.22	21.73
Peterborough .....	0.97	15.03	10.30	13.82	Truro .....	2.44	19.93	16.14	20.18
Yongala .....	1.68	16.55	11.10	14.13	Stockwell .....	2.28	17.14	16.15	20.40
LOWER NORTH-EAST.					Nuriootpa .....	2.63	18.33	16.82	21.09
Yunta .....	0.58	14.14	6.47	8.50	Angaston .....	2.59	19.13	17.67	22.33
Waukaringa .....	0.27	11.30	6.21	8.14	Tanunda .....	3.03	18.05	17.97	22.54
Mannahill .....	0.80	16.05	6.19	8.51	Lyndoch .....	3.70	19.45	18.57	22.81
Cookburn .....	0.79	—	—	8.03	Williamstown .....	4.65	20.20	23.71	27.74
Broken Hill, N.S.W. .....	0.74	13.57	7.59	9.98	ADELAIDE PLAINS.				
LOWER NORTH.					Mallala .....	2.28	15.60	13.41	16.61
Port Pirie .....	1.13	18.51	11.21	13.26	Roseworthy .....	2.57	13.83	13.80	17.37
Port Broughton .....	0.88	16.16	11.48	14.13	Gawler .....	2.67	15.11	15.02	19.14
Bute .....	1.91	17.15	12.80	15.55	Two Wells .....	1.90	12.10	12.83	15.91
Laura .....	3.24	19.45	14.41	18.12	Virginia .....	1.90	13.16	13.99	17.11
Caltowie .....	3.26	19.76	13.34	17.02	Smithfield .....	2.59	13.06	13.66	17.33
Jamestown .....	2.75	19.53	13.85	17.56	Salisbury .....	2.27	13.22	15.09	18.62
Bundaleer W. Wks. .....	2.67	18.84	13.83	17.56	North Adelaide .....	3.87	21.84	17.81	21.87
Gladstone .....	3.14	17.94	12.60	16.05	Adelaide .....	3.07	18.13	17.16	21.01
Crystal Brook .....	0.92	19.99	12.41	15.62	Glenelg .....	2.35	14.44	15.11	18.42
Georgetown .....	2.30	18.46	14.59	18.30	Brighton .....	2.77	18.76	17.44	21.03
Narriby .....	1.15	14.69	13.14	16.43	Mitoham .....	3.61	20.51	19.75	23.68
Redhill .....	1.56	20.93	13.51	16.66	Glen Osmond .....	3.65	20.67	22.20	25.73
					Magill .....	3.42	18.14	20.84	25.38

## RAINFALL—continued.

Station.	For Sept., 1921.	To end Sept., 1921.	Av'ge. to end Sept.	Av'ge. Annual rainfall	Station.	For Sept., 1921.	To end Sept., 1921.	Av'ge. to end Sept.	Av'ge. Annual rainfall
MOUNT LOFTY RANGES.					WEST OF SPENCER'S GULF—continued.				
Teatree Gully.....	3-09	18-92	22-68	27-73	Port Lincoln.....	1-99	13-82	16-84	19-83
Stirling West.....	6-67	34-90	38-96	46-82	Tumby.....	1-90	15-55	11-72	14-76
Uraidla.....	5-10	29-82	37-06	44-49	Carrow.....	1-76	14-59	11-24	15-14
Clarendon.....	4-30	26-61	27-50	33-18	Arno Bay.....	1-46	15-64	10-43	13-10
Morphett Vale.....	2-79	18-79	18-63	22-90	Cleve.....	1-33	18-33	—	14-46
Noarlunga.....	2-98	17-74	16-84	20-21	Cowell.....	0-99	10-09	9-15	11-56
Willunga.....	3-62	22-21	18-54	25-82	Point Lowly.....	1-10	21-01	9-05	11-84
Aldinga.....	2-56	17-73	16-86	20-22					
Myponga.....	5-31	23-68	—	—	YORKE PENINSULA.				
Normanville.....	3-36	23-87	17-20	20-53	Walleroo.....	0-99	17-85	11-61	14-11
Yankalilla.....	3-07	21-24	21-54	22-93	Kadina.....	1-36	19-04	13-22	15-93
Mount Pleasant.....	5-08	27-01	22-36	27-01	Moonta.....	1-23	17-64	12-64	15-93
Birdwood.....	4-83	24-03	23-23	29-43	Green's Plains.....	2-00	17-51	12-97	15-75
Gumeracha.....	5-30	27-79	27-48	33-33	Maitland.....	2-01	20-39	16-63	20-20
Millbrook Rsvr.....	5-15	26-98	—	—	Ardrossan.....	2-16	17-88	11-44	13-96
Tweedvale.....	6-21	28-86	29-73	35-60	Port Victoria.....	1-54	16-13	12-69	15-34
Woodside.....	4-95	26-63	26-69	32-05	Curramulka.....	1-76	14-91	15-03	18-31
Ambleside.....	5-73	28-25	28-52	34-81	Minlaton.....	2-18	17-62	14-82	17-70
Nairne.....	4-51	21-68	23-61	28-58	Brentwood.....	1-90	17-46	14-59	15-44
Mount Barker.....	5-43	26-58	24-71	31-10	Stansbury.....	1-92	16-36	13-88	17-08
Echunga.....	5-83	26-98	27-32	32-94	Warooka.....	2-68	18-75	14-98	17-74
Macolesfield.....	5-32	23-60	25-11	30-60	Yorketown.....	1-70	15-74	14-38	17-29
Meadows.....	5-75	28-30	30-72	36-26	Edithburgh.....	1-91	14-82	13-71	16-58
Strathalbyn.....	3-23	17-29	15-74	19-28					
MURRAY FLATS AND VALLEY.					SOUTH AND SOUTH-EAST.				
Meningie.....	2-66	18-84	15-32	18-77	Cape Borda.....	4-39	25-37	21-61	24-96
Milang.....	2-14	10-94	12-49	15-56	Kingscote.....	2-82	17-68	16-09	18-92
Langhorne's Bdge.....	1-90	14-02	11-52	14-59	Penneshaw.....	3-25	17-86	15-67	21-39
Wellington.....	2-02	14-56	11-51	14-82	Victor Harbor.....	3-54	17-39	17-69	21-56
Taillem Bend.....	2-12	15-26	9-87	24-55	Port Elliot.....	2-86	17-74	16-50	20-00
Murray Bridge.....	1-73	13-93	10-89	13-98	Goolwa.....	2-10	16-62	14-72	17-87
Callington.....	2-74	13-37	12-41	15-45	Karoonda.....	1-85	17-21	—	—
Mannum.....	2-22	14-18	9-23	11-51	Mindarie.....	1-40	9-84	—	—
Palmer.....	3-21	16-37	12-17	15-23	Meribah.....	1-37	10-22	—	—
Sedan.....	2-85	15-96	9-68	12-07	Pinnaroo.....	1-65	18-01	11-91	15-67
Swan Reach.....	1-56	15-14	8-24	10-80	Parilla.....	2-40	14-79	12-13	14-02
Blanchetown.....	0-76	10-19	7-79	10-26	Lameroo.....	2-55	15-14	11-60	16-45
Eudunda.....	2-18	16-05	13-85	17-51	Parrakie.....	2-05	13-08	11-13	14-42
Sutherlanda.....	2-10	13-83	9-29	10-90	Geranium.....	1-97	14-75	12-64	16-24
Morgan.....	1-12	12-93	6-77	9-13	Peake.....	1-79	14-13	12-65	16-25
Waikerie.....	1-23	11-58	7-13	9-41	Cooke's Plains.....	1-90	15-53	11-79	15-00
Overland Corner.....	0-99	9-48	8-29	11-11	Coomandook.....	1-93	17-86	13-84	17-75
Loxton.....	1-78	11-01	9-59	12-27	Coonalpyn.....	1-93	12-96	12-91	17-64
Renmark.....	1-41	11-65	8-08	10-92	Tintinara.....	2-11	13-82	14-70	18-83
WEST OF SPENCER'S GULF.					Keith.....	2-23	15-06	14-42	18-54
Eudla.....	0-57	6-37	8-17	10-03	Bordertown.....	2-07	14-57	15-30	19-52
White Well.....	0-38	—	7-06	9-24	Wolsley.....	2-21	15-08	14-27	18-07
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## AGRICULTURAL BUREAU REPORTS.

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\* No report received during the month of September.

† Held over until next month.

‡ Annual meeting.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

MORCHARD (Average annual rainfall, 13.50in.).

August 13th.—Present: 19 members and five visitors.

**BULK HANDLING OF WHEAT.**—The meeting took the form of a debate on this subject. Mr. B. McCallum dealt with the affirmative side of the question, and Mr. N. S. Lillecrapp supported the negative point of view. A good discussion followed, members generally being in favor of bulk handling. Samples of wheat affected with black rust and blight were tabled by Mr. H. Kupke.

ORROROO (Average annual rainfall, 13.42in.).

August 13th.—Present: seven members.

**FRUIT TREE PLANTING.**—Mr. T. H. Tapscott, who contributed a paper dealing with this subject, considered that one of the main points to be observed in the successful growing of fruit was that the trees should not be planted too closely together. If one only had a small garden plot to plant he thought 10ft. to 12ft. would be sufficiently close for the trees, but for an orchard property he suggested from 14ft. to 20ft. apart, according to the varieties of trees. Apricots, peaches, and nectarines required more space than some of the other trees on account of their spreading and branching habits, but the apple and most of the kinds of pears need not be planted so far apart, as they had a tendency to make an upright growth. Trellised vines could be planted about 9ft. apart. The holes for the trees should be prepared some time before the actual planting took place. He considered a hole 4ft. square and 2ft. deep would do for practically any tree. When digging the hole it was a good plan to keep the surface soil separate from the subsoil, and then when the tree was being planted thoroughly rotted manure could be mixed with the subsoil and placed around the roots of the tree. When the tree was received from the nursery it should be carefully examined, and all bruised and broken roots cut away. It was also advisable to remove the taproot. In order to insure the young tree making a strong growth the speaker favored cutting it well back at the time of planting. The first year's growth should also be well cut back, because it was from the early years of the tree that one was able to train and balance the growth of wood to make a tree of nice appearance and shape. The proper pruning of the trees enabled one to keep them under control from year to year; it also helped to insure the regular cropping of the trees, and enabled one to pick the fruit from the ground. If the tree was allowed to grow to any great height there was always a danger of the wind doing it considerable damage. In the discussion that followed Mr. Graham thought that where it was possible better results would be obtained by subsoiling the land than simply planting the trees in holes. Mr. Zanker was of the opinion that increased yields would be secured if the manure was placed on the top of the ground instead of being placed in the hole with the tree.

## TARCOWIE (Average annual rainfall, about 15½in.).

August 16th.—Present: 16 members.

WASH-OUTS.—In the course of a paper on this subject Mr. J. Burgess said unless some steps were taken to check the very large wash-outs that took place through the heavy rains, many thousands of acres would in years to come be practically worthless. For the work of filling in the places where the earth had been washed away the speaker suggested a grader. The earth was thrown out on either side of the machine, so that if one was working on one side of the wash-out it would simply mean reversing the delivery from right to left as the team turned about. Several cuts some distance out should be made, in order to make long and sloping banks with a gradual fall on either side. When the loose soil had been filled into the openings it should be rolled down. On the slopes or runaways for the water the speaker suggested planting lucerne to hold the land together. He also believed it would be a good plan to plant belts of mallee on any land that was in danger of being washed away during the rainy season. If desired the trees could be cut down after they had been growing for a number of years, and their roots would assist in holding the soil together. Many of the country roads were also being ruined by large streams of water rushing over them. Rubbish of all description was heaped on to fences, which acted as a dam to the large body of water, and in some cases that made a fall of several feet on to the road, with very disastrous effects. He contended that fencing straight along a roadway over a waterway should not be allowed; especially where the water would spread out and run at a shallow depth. If such places were crossed by fences formed in the shape of a V the councils would have a chance of dealing with the water. The V facing up the stream would drift the rubbish on each side of the fence, and leave an opening for the water to spread out on the road. A V facing the same way as the current of the water would provide a much better getaway than the straight fence. He thought that the planting of timber along the roads as suggested for paddocks would assist in overcoming the difficulty and expense that floodwaters caused every year to the farmers and district councils. In the discussion that followed Mr. W. S. Ninnies said the damage caused by wash-outs in their district was a very serious matter. With the writer he agreed that in paddocks lucerne might be used to hold the soil together, but he was afraid that the expense involved in planting trees along the roadsides would be too heavy for many of the councils. A grader had recently been purchased by one of the neighboring local bodies, and it had done excellent work. Mr. Edwards said he had noticed some very good work done on the roads with scoops and shovels. There was no doubt that farmers should pay more attention to the washaways in their paddocks.

AMYTON, August 23rd.—A report of the work performed by the Branch during the past year was presented by the Hon. Secretary (Mr. L. N. Mills), and the delegates to the Annual Congress were elected. A member read an article from the *Journal of Agriculture*, "The Value of Education."

HAWKER, August 23rd.—The question of securing a qualified veterinary surgeon for the district was brought before the meeting, and the fact that a number of cattle in the district were affected with pleuro pneumonia was responsible for an interesting discussion.

HOOKINA, August 18th.—Several matters of local importance were brought before the meeting. Considerable discussion took place regarding the appointment of veterinary surgeons. Members were of the opinion that it would be an advantage to the settlers in the outlying districts if stock inspectors were qualified veterinary surgeons. Advice was received from the Hon. Secretary that a meeting of the Branch would be held on October 20th.

MOUNT REMARKABLE, August 17th.—An interesting evening was spent in discussing the Noxious Weeds Act. Messrs. Shields and Mooney were appointed delegates to represent the Branch at the Annual Congress. Members resolved to do all in their power to awaken fresh interest in the work of the Branch.

WILLOWIE.—The following is the programme of meetings arranged by the above Branch for the year ending July, 1922:—October 13th, delegates' report; November 10th, social evening and paper, "Harvester v. Reaper Thresher," Mr. L. McCallum; December, January, and February, recess; March, paper, "Seeding

Operations," Mr. F. B. McCallum; April, papers, "Tree Planting and Fruit Growing on the Farm," Mr. W. B. Bull, and "Mistakes of Overstocking," Mr. A. Hughes; May, paper, "The Best Poultry to Keep on Farm, and Management," Mr. G. J. Bull; June, paper, "Do Cows and Pigs Pay as a Sideline on the Farm?" Mr. F. Bull; July, annual meeting and question box night. Night of meeting, Wednesday on or before full moon.

## MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 18in. to 19in.).

August 17th.—Present: 12 members and visitors.

**STRIPPER v. HARVESTER.**—Mr. A. Bartrum, who read a paper dealing with this subject, said the choice of machines was governed to a very large extent by the class of country one had to work. For very hilly and rough country he expressed a preference for the stripper, but where the land was level the harvester or reaper thresher was the better implement, because one was able to effect a considerable saving of labor. Each machine had its advantages and disadvantages, but in districts where only light average yields were received the stripper should be used. The most important feature about the stripper was that one was able to save the chaff, which if properly cared for could be put to a very good use in feeding sheep and young stock. The chaff could also be saved with the harvester by attaching a special device to the back of that machine. A feature in favor of the harvester was that when the crop had been harvested into bags the farmer was able to sew up the same during mornings that were too damp and cool to reap, or he could cart the grain into the merchant, and thereby save much weight, which would be lost if the wheat was left in the paddock in heaps to be spoiled by rain. Economy was another item that should not be overlooked. For instance, a farmer working about 300 acres of crop singlehanded should consider which was the more economical, to strip the crop with the stripper and employ labor to help handle it after it was stripped, or to do the work himself and reap the crop with a harvester. The best machine for tangled and weedy crops was the reaper thresher, but he believed the best plan for the farmer in a good season would be to cut part of the crop with the binder and thrash it, thereby making provision for stock in times of drought.

**CITRUS CULTURE.**—In the course of a short paper on this subject Mr. J. Bird said any one who intended planting citrus trees should select a piece of sandy land that was provided with good drainage. If possible the land chosen should be level and adjacent to a good supply of water suitable for irrigating. The land should be thoroughly worked, and the trees planted during late spring or early winter. The trees should be set out about 25ft. apart, in holes sufficiently large to take all the roots without crowding them together. Next, the hole should be filled in, and the earth tramped down firmly around the roots. He did not favor deep planting, for it was inclined to choke the tree. Manure would not be needed during the first year or two after the trees had been planted, but they should be well watered, especially during the dry months of the year. If the watering was carried out by irrigation, the speaker thought good results would be obtained from the overhead sprinklers. The following varieties for planting were recommended:—Sweet oranges—St. Michael and Joppa; navels, Washington; mandarins—Dancy and Nobilis. Lemons, citrons, and poorman's oranges could also be planted. In the discussion that followed, members were not in favor of planting sweet oranges, preference being given to Thompson's Improved Navel.

REDHILL (Average annual rainfall, 16.79in.).

August 22nd.—Present: 12 members and visitors.

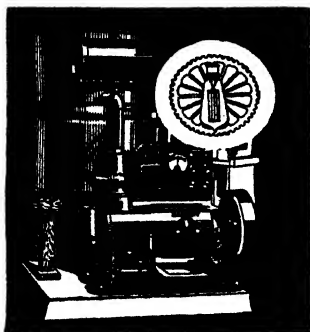
**PREPARATION OF THE SEED BED.**—Mr. M. M. Coffey read the following paper:—As a community we are largely depending on climatic conditions, at one particular time of the year, and one extra shower of rain, passing over a field of wheat, will very often make all the difference between success and failure. All I can claim

for the particular method I advocate is this. It has been very successful over a given number of varied seasons. Let us assume the case of a man owning, say, from 800 to 1,000 acres of a mixed farming proposition in the vicinity of Redhill. He will, if he is an up-to-date farmer, have all harvest work completely cleared up by the end of February, then if he has a paddock or two comprising, say, from 200 to 250 acres which has been well fed off, he might commence ploughing early in March. I am not at all particular what class of plough he uses at this season of the year, as the ground now being ploughed will not be finished with for some 14 months. I would plough, say, from 3in. to 4in. deep. A team worked one yoke should just about dispose of the ploughing in six or seven weeks, which brings you up to the middle of April, when it will very likely be time to be making arrangements for seeding. I would leave the ploughing unharrowed and push on with the seeding. On a well managed farm this operation should be well out of sight by the first of July. We should then proceed to cross harrow. This again will be disposed of in a little better than a week. Now comes the highly important period of working the soil, and too much care cannot be exercised in seeing that whatever class of implement we are working is doing its work thoroughly, for the reason that any strong growing weeds, such as wild turnip, &c., will very soon drive the tap roots so firmly into the ground that it is a big task for any class of implement to later on remove them. I favor a disc cultivator and a good scarifier. The disc should be worked on every possible occasion, only using the other implement when conditions would not allow of the disc being worked. I would next proceed to disc or cultivate it again on the cross. This will bring us well on towards August, when it is more than possible that some of the land will want going over a second time. A handy sized flock of sheep will at this time of the year prove valuable by eating many of the weeds and at the time help to firm the ground by continuous tramping over it. By the middle of September we should have a field of fallow in every way approaching the ideal. After a fall of rain the opportunity should not be missed of working the land with the harrows. I would rather have 200 acres of well-worked fallow than 250 acres, or even 300 acres, of neglected cultivated land. Let your aim be to kill the rubbish and at the same time prepare a good seed bed. Take special care that each working of your fallow is lighter than the previous one. If you follow out this practice you will have by seeding time a firm seed bed, affording just enough mulch as will effectively cover all the grain.

WHYTE-YARCOWIE (Average annual rainfall, 13.91in.).

August 20th.—Present: eight members.

**NOXIOUS WEEDS.**—In the course of a discussion on this subject, Mr. McGregor referred to the tremendous seeding proclivities of weeds. He had never known in his experience of a weed once established in a district being eradicated by any



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**G. S. GIBBINS.**

measures adopted under the Act. He thought it unreasonable to require landholders to clear half the roads adjoining their properties. He considered the Act unworkable. Mr. Sack said that as a member of the district council he was supposed to see that the Act was enforced, but that was impracticable in their district. There were too many plants on the schedule. Many of them were no more noxious than others not included on the list. The Hon. Secretary (Mr. E. Pearce) considered the Act as at present administered was worse than useless. If it was strictly enforced it would prove ruinous to many landholders. If landholders would not, where possible, destroy the weeds voluntarily, in their own interests, they could never be compelled to do so.

#### WIRABARA (Average annual rainfall, 18.91in.).

August 13th.—Present: 20 members and four visitors.

CARE OF THE AXE.—Mr. E. Bairstow, who contributed a paper dealing with this subject, said when the axe was purchased from the shop several defects had to be remedied before it was fit for work. The first thing to do was to cut off the sharp end of the handle, so that it would not get caught in one's clothes. The writer expressed a preference for a short-handled axe, because it enabled one to use it at close quarters to the work, and with a tool of that type one could use it in either the left or right hand, and make the under cuts whilst standing in the same position. When fitting the axe to the handle it was advisable to allow the inside corner of the axe to come in a little, to provide for a proper fall. If the blade of the axe was fitted in a line with the knob on the handle it could be taken as a sign that it had been correctly fitted. The handle should not be fitted too tightly on the inside of the axe. It was a mistake to drive the wedge down into the axe; a much better plan was to make the axe come back, and tighten the wedge. The speaker deprecated the use of nails and pieces of iron for wedges. A piece of hard wood would give much better results. The writer held the opinion that an axe weighing 4½lbs. was the best to use for cutting wood. To make the fall correct, he suggested taking a piece of glass or rasp, and making the inside part of the handle almost round in shape. The correct method of sharpening an axe was to grind down the inside and top corner of the tool very thinly. The face should also be ground down to meet the other two grindings, so that when they met they formed a slight bevel to throw out the chips. Finally, the rough edges should be taken off with a Turkey stone. Mr. H. H. Jericho gave an interesting account of his attendance at the Short Course for Farmers recently held at the Roseworthy Agricultural College. Members expressed the hope that the fixture would be made an annual one. The Hon. Secretary (Mr. E. J. Stevens) advised that the next meetings of the Branch would be held on the following dates:—November 5th and December 17th.

MOUNT BRYAN, July 28th.—Mr. F. C. Richards, of the Department of Agriculture, attended the meeting, and delivered an address, "The Aims and Objects of the Agricultural Bureau." At a further meeting, held on August 20th, the annual election of officers took place, and the delegates were appointed to the forthcoming Congress.

MOUNT BRYAN.—An interesting address, "The Work of the Agricultural Bureau" was delivered by the Chairman (Mr. J. Thomas), and the annual election of officers took place.

NARRIDY, July 23rd.—The subject, "Destruction of Noxious Weeds," was brought before the meeting for discussion, and the delegates to the forthcoming Congress were also appointed. The officers of the Branch for the ensuing 12 months were then elected.

NORTH BOOBOROWIE, August 24th.—"The Dairy Industry" was the subject of an address delivered before the members by the Assistant Dairy Expert (Mr. H. J. Apps). Many questions were answered by the lecturer.

WHYTE-YARCOWIE.—The following programme of meetings for the period ending July, 1922, has been arranged by the above Branch:—October 13th, paper, "Most Satisfactory Farm Fence," Mr. E. J. Pearce; November 10th, paper,

"Labor-saving Devices," Mr. P. M. McEntee; December, recess; 1922—January, "Harvest Notes," members; February, a visit from Secretary Advisory Board, Mr. H. J. Finnis; March, paper, "The Value of a Field Trial," Mr. J. Walsh; April, paper, "Heavy v. Light Seeding and Manuring," Mr. I. Gulladage; May, paper, "Moderate v. Large Sized Teams and Implements," Mr. L. M. Burnett; June, paper, "The Divining Rod as an Aid in the Location of Underground Springs," Mr. G. McGregor; July, annual meeting, Chairman and Secretary. Night of meeting, Thursday on or before full moon.

## LOWER-NORTH DISTRICT.

### (ADELAIDE TO FARRELL'S FLAT.)

CLARE (Average annual rainfall, 24.30in.).

August 19th.—Present: 16 members.

PRACTICAL METHODS OF COMBATING DOWNY MILDEW.—"I wish to make it clearly understood that I am not an authority concerning downy mildew, and how to combat it," said Mr. R. O. Knappstein, in a paper on the above subject, "but, having obtained some information from growers in Victoria who have had practical experience with the disease, I think, perhaps, that the information may be of some assistance to members during the coming season. There are some growers I know who regard the warnings of Government officials and others writers in a light-hearted manner, but from the experience of growers in other States it is to be hoped that all growers will realise the necessity for being prepared to combat the disease. Downy mildew is not difficult to combat, providing growers have their spray pumps and spraying solutions at hand. It is not a bit of use imagining that some varieties of vines are not subject to attack, because no vine is absolutely immune from the disease. Some varieties are more subject to attack than others, and those vines which are most susceptible to black spot are also most prone to downy mildew. The disease, like many fungus diseases, depends on the weather conditions for its development. If the spring and summer are hot and dry, the chances are that the disease will not develop. But, on the other hand, if moist, sultry weather conditions prevail, then those growers who have neglected to spray will realise the damage and remarkable rapidity of the spread of the disease. The disease, fortunately, gives warning of its presence before the spores are developed, and its presence can be detected by the oil spots or marks on the leaves. These marks show in light-colored patches on the leaves, and it is then quite evident to the grower that spraying must be carried out. The spores develop in a few days after the spots appear, and, if the weather conditions are favorable to its growth and no spraying has been done, very soon the vineyard will be as bare of foliage and fruit as in mid-winter. The vine is subject to attack, so I am informed, during the whole period that it is carrying foliage, and the grapes are subject to attack right up to the time when they soften, which means, of course, that the danger of infection is not over until the grapes are thoroughly ripe. Experienced growers recommend the use of Bordeaux mixture to combat the disease. It is not so easily washed off the foliage as Burgundy mixture, and, therefore, retains its virtue as a fungoid preventive over a more lengthy period. The strength recommended is 10lbs. bluestone to 50galls. of water, with enough lime added to make the mixture alkaline. The growers are of the opinion that a weaker solution than the one recommended is not of much use, and they prefer to make it strong, rather than weaken it. In fact, one grower said that his first spraying this coming spring was to be 10lbs. bluestone to 40galls. water, that is, of course, with the addition of lime. His idea in making such a strong solution was that the first spraying was the most important one, and had to stand the effects of weather the longest time; and, furthermore, he added that it was difficult to spray the middle of the vine at about the flowering stage, when the second spraying should be done. Consequently, by spraying with a strong solution at the first operation, the middle of the vine would be practically immune against the ravages of the disease throughout the season. This, to my idea, is a strong point in its favor, seeing that some



of our vines make such dense growth in the spring, and consequently it would be difficult to get the spray well into them at this stage of growth. The method adopted for making the Bordeaux solution is very interesting. Seeing that no great reliance can be placed on the quality or freshness of burnt lime, the growers obtain a supply, and slake it off straight away in tubs or other suitable vessels. After it is completely slaked it is covered with water, and will retain its good qualities for some time. In fact, some growers slake their lime two months prior to use. The fact of the lime being covered with water for so long a period dissolves the small gritty particles, and hence the trouble with choking spray nozzles is overcome. When the grower is ready to start spraying, 10lbs. of bluestone are dissolved in water, and enough of this lime paste is poured into the dissolved bluestone liquid to make the mixture alkaline. The test for alkalinity is with a test paper, which changes color as soon as the solution is alkaline. Enough water is then added to make the solution the strength the grower decides to use. If the lime paste be too thick to pour, the addition of water will soon remedy this trouble. Growers should note that the lime must be poured into the bluestone, and not *vice versa*. The addition of casein is recommended by one writer of a paper on downy mildew to make the mixture stick to the surface of the leaf better, but I could not obtain any information from growers on the subject, because they have never used it. When downy mildew first broke out in Australia, no spray pumps of suitable types were to be obtained, and vignerons had to set to work and make pumps for themselves. Some of these pumps were very crude, but at the present time we can obtain excellent outfits, capable of doing the work required in a thoroughly efficient and cheap manner. The style of pump to be used rests with the grower himself. If he requires a pump for spraying orchards as well as vineyards, he can use a hand or a motor power plant, but if the pump is intended for vineyard spraying only, a horse-drawn tractor spraying machine is generally used. The pump of this machine is worked off the axle or wheel with an eccentric or crank. In the eastern States where only vines are sprayed, the horse-drawn tractor is in general use, and gives thorough satisfaction. These machines are capable of spraying large areas quickly, cheaply, and thoroughly. The rear of the machine is equipped with horizontal arms, which reach right over the vines on each side of the machine, and on these arms droppers are fastened, which hang vertically, and are adjustable to any desired height or width. Spray nozzles are fitted on these droppers, and can be set to spray in any direction which the operator chooses. With some machines one row at a time can be sprayed, and with others two complete rows can be finished in the one operation. The spray nozzles should be so arranged that they point slightly downwards and backwards. The idea of spraying downward is because the disease always starts on the upper surface of the leaf, so we have to put the Bordeaux mixture on the top of the leaf to prevent the spores from developing. The first spraying for the season should be carried out when the young shoots are about a foot long, or when it is possible to distinguish the young bunches. The second spraying is usually carried out about the flowering stage, and followed later on by another just before the grapes begin to color. However, no hard and fast rule can be laid down when to spray, as it all depends upon the weather conditions, but it is always advisable to give the vine one good spraying early in the season. If the weather is hot and dry, and continues so, no further sprayings may be necessary; but if the weather is sultry and moist, further sprayings will be necessary to prevent the new growth from being attacked by the disease. Spraying should always be carried out in fine weather, and as soon as possible after a rain. Seeing that the disease has been detected in our district, it means that the grower who does not spray is courting disaster. America and France have had many years of experience in trying to eradicate the disease, and have found out that the only way to successfully cope with it is to spray thoroughly, and so prevent the spores from developing. Weather conditions have all to do with the development of the disease." An interesting and instructive discussion followed. Mr. M. L. Nolan asked whether the second and third sprayings were of the same strength as the first. Mr. Knappstein replied that, so far as he could ascertain, they were. The spraying mixture should not be less than 2 per cent. bluestone. Rutherglen vignerons reported an increase in sugar content up to 2 per cent. since using Bordeaux mixture for spraying downy mildew. Mr. Eaton mentioned that he had read that the addition of soap to the spray solution acted as a spreader, and gave a more uniform covering.

LYNDONCH (Average annual rainfall, 23.01in.).

August 18th.—Present; 16 members.

**SPRAYING.**—The following short paper on this subject was contributed by the Hon. Secretary (Mr. J. S. Hammatt):—The number of insect pests and fungoid diseases seem to be on the increase. Irish blight is found on the potatoes; aphides on the roses, cabbages, apples, and peaches; caterpillars attack the plants; oidium and anthracnose affect the vines; downy mildew had been reported last season near Clare; scale insects damage the olives and oranges; fusicladium spoils the apple and pear crops; shothole disfigures the apricots; leaf curl and curl leaf rob the peach trees of their fruit. Never in the experience of the horticulturist has there been a greater need for a slogan cry to arouse the individual to immediate action. Spraying is the means of prevention. We must destroy the vanguard before the army gets to work. There are three classes of enemies to be considered:—(1) Fungus diseases; (2) insects that nibble or chew their food; (3) insects that suck the juices of plants for their food. (1) Fungus Diseases.—Remedies during June and July—(a) 3lbs. bluestone in 50galls. water; (b) Bordeaux mixture, 6lbs. bluestone, 4lbs. lime, 50galls. water; (c) Burgundy mixture, 6lbs. bluestone, 9lbs. soda, 50galls. water. The best results are obtained by using (b) or (c) when the buds are beginning to show a bit of color, and again later by using a summer strength of 4-4-50. (2) For insects that chew their food.—There is nothing better than arsenate of lead if applied at the right time. The spray applied when petals are falling is the most important of all. (3) For aphides and other sucking insects.—Any of the following remedies:—Kerosine emulsion, soft soap and tobacco, or red oil, are effective if put on with plenty of force. The chief points to observe are use pure materials, mix them thoroughly, apply at the right time, and see that every part of the tree is coated with a fine spray.

<b>W</b>		<b>ALLAROO</b>		<b>M. LYELL</b>	
<b>THE</b>	<b>BIG</b>				
<b>CHE</b>	<b>QUE</b>				
<b>PRODUCER</b>					
<b>FERTILISERS</b>					

## MAILLALA (Annual average rainfall, 16.88in.).

August 1st.—Present: five members.

**TREE GROWING ON THE FARM.**—A paper on this subject was contributed by Mr. J. A. Arnold, and read by Mr. J. Arnold, jun. The writer was of the opinion that tree growing was one of the most important, and probably one of the most neglected, subjects that the farmer had to deal with. It was important in that it provided a sure supply of firewood, rails, &c., for the farm, and shelter from rough winds for the homestead and the stock. A trip through any of the farming districts of the State would show that planting was not carried out to the extent that it should be, and a number of homesteads could still be seen without trees of any kind around them. All that was required to have beautiful plantations around the home was a little work in preparing and fencing the land, and an application to the Woods and Forests Department for the trees. Under such conditions, it was surprising that farmers did not avail themselves of such an opportunity. What was prettier or more useful than a nice fruit and flower garden around a farm house, and the whole protected by a good thick belt of useful timber? The land selected should be deeply fallowed and worked well during the winter previous to planting. Too much attention could not be given to working the land, because as much moisture as possible should be conserved, and the mechanical condition of the soil be such that practically every tree would start. Gaps were hard to fill in a strong, vigorous plantation, and particularly after the first year. If the trees were planted about 12ft. apart, sufficient room would be provided in a suitable soil for a fairly large growth. A good plan was to draw a light log along a proposed line of trees, and then across the first track, and plant at the intersection of the lines. The trees should be secured from the nursery early in July, and planted the day following their arrival on the farm. Under present conditions of issuing trees from the nurseries, he preferred the pot plants, as those in tubes were very often too small. The young trees should be set out about 2in. deeper than the original planting, and a hollow left around the stem of the young tree about 1½in. deep to catch the rain. The plantations should be well worked until the trees were large enough to keep grass and weeds down—usually about four years. Unless on very stiff soil, most of the working could be done quickly and efficiently with a chisel harrow, and if the trees were planted carefully in rows each way, nearly all the ground could be covered. As to the kinds of trees to plant, where the soil was suitable the sugar gum took first place. If the soil was very light and rubbly, blue gums would do better than the sugar gum. A plantation of, say, three or four acres of gums, so arranged as to break the prevailing rough winds, would provide shelter, firewood, rails, poles, etc., for the use of the farm. The sugar and blue gums, when cut at about seven or eight years' growth, provided splendid firewood—quite equal to mallee—and the growth after cutting was very rapid, and, in most cases, there were two and three trunks for the second cutting. He usually began cutting at one side of the plantation, so that by the time he had cut through, the first cut would make a fair shelter. The different kinds of pines made beautiful breaks and plantations, but were slow in growth, and would not grow after being cut down. The Aleppo pine was a particularly handsome tree, and a good grower on light soils; but it only made very slow growth during the first five or six years. In conclusion, the writer impressed on members the need for liberal plantings of trees, as the firewood question would be a serious one in years to come. Every paddock should have a small clump of trees for shade. It was not an uncommon sight to see stock, during a heat wave, lying down panting in a paddock absolutely devoid of shade. Such a thing should not be in a country where trees grow so readily. Surely, when the trees were supplied free, it should not be too much trouble for each and every farmer to have a few acres under timber.

## WILLIAMSTOWN.

August 11th.—Present: 30 members.

**ANNUAL SOCIAL.**—The meeting took the form of a social in conjunction with the Ladies' Branch of the Agricultural Bureau. A good programme of songs, recitations, and instrumental pieces was arranged, and the following ladies and gentlemen assisted:—Mesdames R. Filsell, E. J. Howarth, Leditschke, J. Fry, Smith,

and D. Wilkin, and Messrs. Zimmerman, J. Fry, and Wilkin. Games were indulged in by members and their families, and supper was provided by the ladies.

**NANTAWARRA, August 18th.**—Delegates to the Annual Congress were appointed, and the meeting discussed other matters in connection with the subjects set down for discussion during the Free Parliament. The Hon. Secretary (Mr. C. A. Pridham) advises that the November meeting will be held on the 10th of the month.

**WATERVALE, August 15th.**—A short discussion took place on the best measures to adopt to treat vines affected with black spot. The majority of members were of the opinion that the best mixture was one made from 4lbs. of lime, 4lbs. of bluestone, and 40galls. of water. A committee was also appointed to draw up a programme for the ensuing six months.

**WILLIAMSTOWN, September 7th.**—Mr. J. Osborne read a paper, "Pruning," and a paper on the subject, "Spraying," was contributed by Mr. E. J. Powell. Interesting discussions followed the reading of both papers.

## YORKE PENINSULA DISTRICT.

(TO BUTE.)

**ARTHURTON** (Average annual rainfall, 16in. to 17in.).

August 19th.—Present: 13 members and visitors.

**RABBIT DESTRUCTION.**—Mr. C. Williams exhibited a machine for pumping fumes into burrows for the destruction of rabbits and foxes. He also gave a demonstration of the methods for preparing the fumes. Mr. Williams stated he had used the machine on his property with excellent results. He thought if five or six farmers co-operated and purchased a machine and the necessary chemicals, the cost for materials sufficient to destroy all rabbits on badly infested farms would not amount to more than three or four pounds per man. Mr. K. Roads gave an interesting report of the short course for farmers at the Roseworthy Agricultural College. He spoke in high terms of the benefits that the man on the land would derive from the lectures and addresses delivered by the officials of the College and the expert officers of the Department of Agriculture, and trusted that the fixture would be made an annual one.

## BRENTWOOD.

July 21st.—Present: 12 members and two visitors.

**ARGUMENTS IN FAVOR OF A COUNTRY BUTTER FACTORY.**—Mr. C. H. Boundy, who contributed a paper dealing with this subject, said when the above subject was broached one naturally asked, "Why do we need a butter factory?" It could not be denied that the shipping of the cream to Adelaide was responsible for a large reduction in the profits to the producer, and, again, many country towns had to obtain their butter supplies from the city, which meant an increased cost to the consumer. Coupled with that would be the transport charges to and from the city. By the erection of a local factory the cream would reach its destination in a sweet condition, and there would be very little danger of the cans going astray. The farmers would also be able to send their cream into the factory several times during the week. The fodder resources of that district were very suitable for the expansion of the dairying industry. If a factory was erected at Stansbury the products could be shipped regularly, as Stansbury was favored with a bi-weekly service to Adelaide. It would also be an incentive to farmers to keep more cows, and, as a natural consequence, pigs would be kept to consume the byproducts. He was of the opinion that a factory run on co-operative lines would prove the most successful, because if local producers subscribed the capital they would be anxious to supply as much cream as possible. A splendid discussion took place, and a unanimous vote in favor of a district butter factory was carried. A committee was appointed to draft a circular, a copy of which was to be sent to every producer in Southern Yorke Peninsula, asking for an expression of opinion in regard to the matter.

## KILKERRAN.

August 18th.—Present: 10 members.

**TILLING THE SOIL.**—The following paper was contributed by Mr. S. Keightley:—One of the first principles to be taken into consideration to ensure the best returns from the crop is early fallow; by that I mean land that has been broken up as early as possible after the first rains. The experience I have had in this district leads me to think that land ploughed in the autumn does not suit our limestone country. I would advocate a plough with a 6in. to 7in. cut, working to a depth of about 3in. The smaller cut does not break the ground so roughly as a wider cut, consequently the land does not require so much working to reduce it to a fine tilth, which is necessary for the best conservation of moisture. After ploughing is completed I consider it advisable to harrow, and if the land is rough after going over it once, it should be cross harrowed. I should then run sheep on the fallow, so as to keep the weeds in check. In the spring I would work a cultivator or skim plough, crossing the ploughing. If the ground is not too hard I prefer a 6in. spring-toothed implement, as the constant vibration of the springs helps to shake the land loose and bring the finer soil to the surface. A depth of about 2in. is all that is necessary to ensure the cutting of any weeds that are growing. Such a working will not disturb the seed bed. In the heavier soils I would advocate harrowing after the cultivator, but in the sandy country I would not level the ground after it had been cultivated; furrows left by this implement have a deterring effect on any patches likely to drift. The heavier soils, providing the time is available, can be harrowed after every rain. This will help to keep the top soil loose, and prevent loss of moisture through evaporation. As soon as possible after the harvest, and providing the fallow is clean, the harrows or a light cultivator can be worked to advantage, but owing to the summer weeds that of late years we have had to contend with, it is necessary in nearly every case to work the fallow either with the cultivator or skim plough. In most seasons this working will suffice until seeding operations commence. The majority of farmers do not believe in dry sowing wheat, preferring to wait until the rain to begin seeding, but my experience has been that, providing the fallow is clean, the best result will be obtained from dry sowing.

## MATTLAND (Average annual rainfall, 20.08in.).

August 6th.—Present: 12 members.

**IMPROVEMENT OF HORSE STOCK.**—The following paper was read by Mr. F. H. Francis:—There are two great forces underlying all breeding operations; first, the tendency of like to beget like, and second, variation. Variations that are not transmitted are of no importance in breeding, though they may be of consequence to the animal possessing them. Horse breeders believe that if high-class trotters are to be produced they must mate animals that can trot fast; that if high-acting horses are desired, high actors must be united; and that if heavy horses are wanted, horses of weight must be mated. Prepotency is of great importance in improvement, as there is variation among parents in their power to stamp characters upon their offspring. Purity of breeding makes for prepotency. The introduction of outside blood lessens the certainty of transmission. In breeding, the prepotency of the male receives first consideration, because the sire is parent to more individuals than the dam. This is fortunate, as improvement can be more cheaply secured through a good sire from the fact that he is represented in more progeny. Soundness is essential to improvement. Both sire and dam should be free from all forms of unsoundness or disease that are transmissible to the offspring. Not until both mares and stallions are free from unsoundness can we hope to raise the standard of our horse stock to the highest degree. Environment plays its part in improvement, and no single factor influences development to a greater extent than food supply. Full feeding increases the size and the constitutional vigor, while withholding food not only arrests growth, but weakens the capacity for future development as well. Many persons have fallen short of success in breeding by depending upon blood alone for improvement. They have forgotten that breeding and feeding go hand in hand to improvement. All our improved breeds are the product of adequate nutrition, combined with intelligent breeding, suitable environment,

and kindly care. No single factor has a greater tendency to lower the standard of horses in this State than the continued influx of rejected stallions from Victoria. The Horse Breeding Act, 1919, of Victoria provides that no stallion shall be allowed to be used for stud purposes unless he holds a Government certificate of soundness. The certificate will also be refused in cases of animals considered by the examining officer to be below a reasonable standard for Government approval as regards type, conformation, and breeding. If similar legislation were passed in this State it would prove a benefit to horse breeders and an advantage to the State, for we cannot afford to propagate inferiority in horse stock. It is a more serious problem than in most other forms of livestock, for if we breed an inferior cow or a wasty sheep it can be killed, and some good got out of it. But a scrub colt is a source of annoyance and a loss to its owner.

MOONTA (Average annual rainfall, 15.22in.).

August 13th.—Present: 21 members and five visitors.

THE BOY ON THE FARM.—Mr. A. B. Ferguson, who read a paper dealing with this subject, said the fact that the rural population was decreasing and the number of people in the metropolitan area increasing, was a serious problem to any country whose chief sources of wealth were derived from agricultural and horticultural pursuits. For many years past everyone had complained about the high cost of living, but that could not be wondered at when one realised that 25 per cent. of the population had to produce food supplies for the rest of the community. In view of



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the foregoing facts, it was important that the primary producers of the next generation, i.e., the boys of to-day in the country, should be given every encouragement to stick to their work on the farm. It might be said by some that, "My boy wants to be an electrician, or a chemist, or an accountant," but the speaker believed that there was ample scope on the farm for the boy to show his abilities, if he was of a mechanical or professional turn of mind. If the boy showed a natural dislike for any particular class of work, he contended that it was a mistake to force such labor upon the young man. The milking of the cows was a job that was frequently distasteful to the young people, but the writer thought if they were given a share in the proceeds from the butter and cream it would stimulate an interest that would soon develop into a liking for the work. Farmers should strive to awaken the spirit of ownership and responsibility in the boys by giving them a calf or some other animal, and allowing them to care and tend to it. The old adage, "All work and no play makes Jack a dull boy," was still very true, and especially as regards the boy on the farm. The young people should be provided with such things as would enable them to enjoy their hours of recreation on the farm to the fullest extent. He believed that if the boys and girls were afforded the opportunity of indulging in music, singing, and elocution, much would be done in the way of social entertainment, which was so necessary for contentment in rural life. One other point that the farmer should not overlook, and that was to give the boy a word of encouragement when he performed his work in a praiseworthy manner. Mr. J. Atkinson, in opening the discussion, said the proper treatment of the boys on the farm was a point worthy of the earnest consideration of every farmer. He thought the farmers' watchword should be "Patience." Mr. W. Edge believed the whole question could be solved by making life on the farm attractive. Mr. A. H. Carne strongly favored the point brought forward by the writer, that of awakening in the young man a sense of ownership and responsibility in connection with the working of the holding, but he thought it would be a mistake to keep the young man on the farm who showed a natural ability for some other trade or vocation in life. Messrs. Martin, Cliff Wearing, Kitto, Warmington, and Middleton also spoke.

#### PASKEVILLE (Average annual rainfall, 16.10in.).

August 16th.—Present: 11 members and visitors.

**HARVESTER VERSUS STRIPPER.**—Mr. J. A. Sykes read an article on this subject, and in the discussion that followed, Mr. J. C. Price said that, judging from the present outlook and the general trend of things affecting agriculture, it was necessary for the man on the land to introduce and make use of that class of machinery that would get through the work of harvesting in the shortest time. The last season, with its rain storms, was evidence of that. Mr. Lee thought there were points in favor of each type of machine. Some farmers had rough portions of land—sandhills, &c.—on their holdings, upon which probably the stripper would be found to be better adapted, and the motor winnower would be utilised to do the clearing up; but for plain land and even country he preferred the harvester. Mr. J. Bussenchutt favored the harvester, because it performed the reaping and cleaning in one operation. The use of the stripper entailed a considerable amount of work and loss of time in preparing the grain for market. Mr. Young agreed that the harvester was the best machine for plain land when in the hands of a competent and careful man. The Chairman (Mr. Banman) thought each machine had its good points. He believed there would yet be a machine evolved that could be worked with less power of draught than was required to draw the present-day harvester.

**DOWLINGVILLE, August 31st.**—The meeting was devoted to a discussion on the securing of a veterinary surgeon for the district. Other matters of local interest were brought before the gathering.

**MAITLAND, September 3rd.**—Mr. W. Bayley, who represented the above Branch at the Roseworthy Agricultural College Short Course for Farmers, gave a very instructive resume of the various lectures given by the departmental experts and officers of the College.

## WESTERN DISTRICT.

## BIG SWAMP.

August 15th.—Present: nine members.

**EARLY *versus* LATE LAMBS.**—Mr. T. Proude who initiated a discussion on this subject, spoke in favor of the late lamb. The Hon. Secretary (Mr. R. L. Sinclair) was of the opinion that lambs dropped in May were much better than those born during August. In reply to a question from Mr. McFarlane as to whether gum shoots were injurious to sheep, members thought that it was very seldom that the sheep would receive any harmful effects from eating the shoots. The Hon. Secretary (Mr. R. L. Sinclair) tabled a sample of elephant grass. One plant produced 28 stools. From his crop he hoped to secure sufficient plants to sow a small plot, and give each member of the Branch a root with which to experiment during the coming season.

## BIG SWAMP.

August 18th.—Present: eight members.

**MERINO SHEEP.**—Mr. L. H. Gotch read an interesting paper on this subject that had been compiled from the handbook written by Mr. W. S. Kelly, "Beef, Mutton, and Wool." In the discussion that followed, Mr. Chapman bore testimony to the steadily increasing improvements in the weight per fleece during the past 20 years on Eyre Peninsula. Mr. Smith also spoke in the same strain, both in reference to local improvements and also that of the North. The Chairman (Mr. G. Gotch) considered that, with the aid of suitable fodders, lamb raising for export should be a paying proposition. Mr. Hookings was not sanguine regarding meat export. All were agreed that the Merino was the best sheep to keep under Eyre Peninsula conditions.

BUTLER (Average annual rainfall, 16.61in.).

August 22nd.—Present: nine members.

**PEDIGREED STOCK.**—Mr. C. F. Jericho, in the course of a short address on the subject, deprecated the value of pure-bred stock. He contended that because a man was reputed to be a breeder of pure-bred stock, that could not be taken as a guarantee that the stock owned by him were pure-bred animals. He had recently purchased what he was led to believe was a pure-bred Merino ram, but he had since learned that the animal was a cross-breed. In speaking about horses, Mr. Jericho said it did not make any difference whether one had pedigreed stock or not. The important point was to feed the foal from the time it was weaned until it was ready to take its place in the team. He had frequently exhibited his horses in the show, and they had beaten pedigreed animals. In the discussion that followed, Mr. Pfizner said he could not agree with what Mr. Jericho had said. The rearing of pure-bred stock should be one of the aims of every farmer. If Mr. Jericho was to give the pure-bred animals the same care as the cross-bred stock, he would very soon notice a vast difference in the general conformation and quality of the stock, whether they were sheep, cattle, or horses. It was his intention to purchase during the coming season a few pedigreed ewes and a ram, and he hoped to be able to prove to Mr. Jericho the value and benefits to be derived from the keeping of pure-bred stock.

GREEN PATCH (Average annual rainfall, 26.56in.).

September 5th.—Present: six members.

**FARMERS' INCOME TAX RETURNS.**—The following paper was read by Mr. C. J. Whillas:—This paper is written with a hope that it may be of some little use to those farmers who keep no books, but wish to make out their own income tax returns with the least amount of trouble. Broadly speaking, a farmer's annual income is the year's sales of his products, plus the increase or minus the decrease in value during the year of his livestock and unsold products, minus his year's



revenue expenditure. A farmer's expenditure may be divided into three main classes, viz.:—(1) Private, money expended upon his own and his family's comfort and living; (2) capital, money expended upon increasing the permanent value of his property, such as farm improvements and purchase of plant; and (3) revenue, money expended on, or for the working of, the farm and the upkeep of the improvements. For income tax purposes the latter is the only expenditure that matters. Capital and private expenditure are rightly not allowable deductions from his receipts in determining his income. At the end of each income tax year, June 30th, to fill in correct returns the least that is necessary is:—(a) A list of stocks on hand, livestock, wool, grain, hay, and other products, with valuations both for the start and the end of the year; (b) a list of plant, with valuations, including for the beginning and the end of the year, and the depreciation written off during the year; (c) a classified list of receipts, *i.e.*, all moneys received during the year; and (d) a classified list of the revenue expenditure for the year. I know many farmers manage the business without all this bother. They simply go to an agent, make a guess at most of the particulars wanted, and trust to the cleverness of the agent to make out a return that will pass muster. They not only run the risk of having trouble later on, but owing to farmers' receipts being mostly large and easily traced amounts, whilst the expenditure is in small and many easily missed items, the odds of the guess method are against the farmer. It is better to take a little trouble, and get it all in. For assembling and putting into shape the above-mentioned data, loose sheets of writing paper can be used, though a large leaf manuscript book would be better. If loose sheets are used they must all be attached to a copy of the return, and kept for future reference. For preparing (a) stocks on hand, make out a list of all unsold wool, hay, grain, &c., with valuations at fair market value, both for the start and the end of the year; and the same for the livestock owned, valuing in this case as per the instructions issued with the returns. The stocks on hand shown in the previous return must, of course, be used as the stocks on hand for the start of the year. Then enter the particulars obtained on the returns. (b) Plant depreciation.—The State returns simply allow you to charge, as a working expense, the cost of renewing any worn-out plant. This is a simple but crude substitute for depreciation. The Federal returns allow plant to be written down each year, which is fairer, but entails more work. For instance, a farmer buys a new plough, uses it for a season, then sells it again. It is, of course, not so good a plough as when he bought it, and he would expect to get less for it than he gave. The difference is the year's actual depreciation in value, and is a just charge on that year's working expense. No hard and fast rule can be made for arriving at the amount to be set aside as depreciation. For our purpose an approximate percentage each year in the diminishing value is about the most suitable method. For farm plant in use every season, 10 per cent. per annum on the diminishing value should be about a fair charge, and, as it is only an estimation, it is not necessary to go into the exact amount and get too many small figures. For instance, if a farmer buys a harvester for £150, for the first year the depreciation would be £15, and book value at the end of the year £135; second year, depreciation £13, and book value at the end of the year £122; third year depreciation £12; and so on. Next, make out a list of all the plant, put a value on each item, for the start of the year, this being, of course, cost price where new, or the written down value put on the previous year, that is, if you have supplied the Taxation Office with same. Then show the amount of depreciation of each item, and the written down value of the implement at the end of the year. Add up the total of the year's depreciation, and enter it in the return where specified. It is necessary to attach a copy of this list to the return. (c) Receipts for the year.—You need to know, not only the total money received during the year, but for exactly what this money was paid you. A farmer should pass all his money transactions through his bank account. His pass book then will be a record of his receipts and expenditure. But it will not give him sufficient details to enable him at the end of the year to segregate his accounts. These details can be very simply recorded on his cheque heels, using the backs of same, for the amounts paid into the bank, stating date, name from whom received, item, and amount. You now should make out separate lists under their right headings of all these amounts, so as to arrive at the totals for the year. Take a sheet of writing paper, fold four times each way, crease, and then open out again. The crease marks will divide the paper into 16 equal-sized rectangular spaces. Start in the pass book from

# PROOF POSITIVE

## KARSWOOD POULTRY SPICE

### DOES NOT FORCE THE BIRDS.

Here is a letter written by a Poultry Disease Expert in Pretoria, South Africa, to the Karswood Agent in Johannesburg. Remember that the climate in South Africa is much the same as in Australia.

*From George Bustin, Poultry Disease Specialist, 489, Proes Street, Arcadia, Pretoria, Transvaal.*

"The following experiments with Karswood Poultry Spice sold by you, and which I bought and tested on behalf of some of my clients to determine if it had any injurious effect on the system and reproductive organs of the hen, may be of interest to you.

So many spiced foods (many of which contain cayenne pepper and other injurious ingredients) are sold to the public, which cause what is termed "yolk hypertrophy," that is, the yolks become much larger than normal, and these big yolks are due to a diseased condition of the organs, caused by too much forcing for egg production, with the result that the egg breaks loose from the ovary without rupture of the follicle wall along the stigma, but breaks and tears loose the stalk or pedicle of the follicle, with consequent death.

With your Karswick Poultry Spice I found no such indications.

I treated a number of backward white Leghorn hens (some partly in second moult), with the result that after seven days they began to lay, and it also completed their moult within 14 days.

That was two months ago. They have been laying continuously since April 20th, and are still doing their duty at a

time when new laid eggs are 5s. to 6s. a dozen on the market, and unobtainable from most poultry yards.

I killed one of the hens treated with Karswood Poultry Spice, also one which was not treated, and in comparison I found the organs of the hen which had Karswood Poultry Spice in far healthier and better condition than the bird which had no Karswood Poultry Spice.

Such organs as the ovary, ovicle, stigma, funnel (or infundebulum) of the egg tube were in splendid condition. In fact, in every portion down the opening of the cloaca, which as you know, opens into the rectum, the oviduct and the ureters or kidney ducts were in the same condition.

I must conclude by saying that birds which have Karswood Poultry Spice are in a firmer reproductive fettle than those without. I shall always use Karswood Poultry Spice in future (in moderation), and have recommended it to a great many poultry keepers in this town and elsewhere.

The makers and your firm are to be congratulated upon such a useful adjunct to successful poultry keeping.

(Signed) GEORGE BUSTIN.

June 11th, 1920."

## KARSWOOD POULTRY SPICE

Containing ground insects, costs little to use.

A HALF-PENNY A DAY TO MAKE 12 HENS LAY.

**4d. packet supplies 12 hens for one week.**

**1s. packet supplies 20 hens for 16 days.**

**2s. packet supplies 20 hens for 32 days.**

**7lbs. tin (14s.) supplies 140 hens 32 days.**

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**SOUTH AUSTRALIAN MILLING & TRADING Co.,**

**BAKER STREET, PORT ADELAIDE.**

If supplied direct, postage is charged extra.

July 1st, and enter the amounts paid in on the sheet of paper under its right heading, referring to the cheque butts for further details, and using a separate space on the paper for each heading. The following headings should cover the average farmers' receipts, viz., wool, wheat, other grain, chaff, sheep, cattle, skins and hides, and cream. Add up the totals of the lists under each heading, then enter them on the return. (d) Revenue expenditure for the year.—This can be treated in the same way as the receipts. It will greatly facilitate the segregation of the expenditure if, when drawing cheques, you fill in on the heel any items that the cheque pays that is a charge against working the farm. Many of the cheques will be wholly for one item, such as, say, super, but you may pay a cheque at your general store that is partly private expenditure and partly for the farm. You must either show the details of the items for the farm on the heel of the cheque or extract them from the invoices. The following headings should cover the average farmer's revenue expenditure, viz., wages (separate list for each employee), interest, seed, super, oils, &c., smithing, saddlery, machine parts, hardware, other farm supplies, rates and taxes, insurance, and sundry farm expenses. Some of these items are specified for in the returns; all that are not must come under the head of other business expenses on the return, remembering that you are entitled to deduct from your income all the revenue expenditure. Where the details cannot be entered on the return it is necessary to attach to the returns detailed lists. A farmer whose sons or daughters help him with the farm work is entitled to charge wages for same at current rates. He can also charge as a deduction any out-of-pocket expenses he may be put to in travelling for business purposes. The State return differs from the Federal return in not allowing life insurance premiums as a deduction, and the former allows only £15 per child per annum, against the Federal £26, as a deduction. In the State return the employees' keep deduction is exclusive of meat and farm products used by them, whereas in the Federal you include them, but their value is credited as income. There is one unjust point taken by the Federal authorities. You have to charge all sheep and cattle killed for rations as income at their average value. You also have to put in as income the money realised by the sale of the skins and hides from the ration sheep and cattle. Your income is thus credited with these skins and hides twice, both alive and dead. In conclusion, it would be much better for a farmer to keep some simple system of books for recording his affairs. The above is only an outline of how income tax returns can be made out without books.

KOPPIO (Average annual rainfall, 22.40in.).

August 15th.—Present: nine members.

**SORGHUM AS AN AUTUMN FODDER FOR SHEEP.**—"The best method of providing late autumn and early winter feed for sheep," said Mr. R. Richardson, in a paper on the above subject, "is a problem which has to be faced by the majority of pastoralists and farmers, more particularly to those carrying lambing ewes. Our experience has been that early lambs, dropped at the end of March and early April, are the best. The stubbles can usually be reckoned on to keep the sheep going up to about March, after which other methods must be resorted to. Hand feeding can be carried out successfully with the dry sheep, but the experience of several years has convinced us that it is not the ideal method of feeding lambing ewes. It tends to unsettle the ewes, and they are apt, especially in the case of young ewes, to leave their lambs, and come down to the feeding troughs with the flock. The crops which have proved most successful with us are pease and rape, sown together, and sorghum. The former can be drilled on the fallow, say, 1½ bush. of pease and 1½b. rape to the acre, and lightly fed off some time in January to keep the rape down, and then left till wanted in March and April. A crop of sorghum was sown in a paddock of about 13 acres. The field was ploughed on September 2nd and 3rd, cultivated with the spring-tooth cultivator on September 20th, and harrowed, drilled on September 21st with turnips, 1½ acres; maize, 1 acre; sorghum, 10 acres. I might here mention that the turnips were badly attacked by grubs, and the maize was cut for the cows, so that they provided practically no feed for sheep. Sorghum was drilled in at the rate of 3lbs. per acre, with 70lbs. of 45 per cent.

to 47 per cent. mineral super. Rainfall fell as follows:—During October, 185 points; November, 183 points; December, 89 points; January, 120 points; February, 33 points; March, 83 points; April, 94 points; so that conditions were favorable for a summer crop. The first feeding was from December 28th to January 14th, when 290 sheep were put on, which works out at 1.27 sheep per acre per annum. The second feeding was from March 1st to March 15th, when 250 sheep were grazed for 14 days, which works out at .96 sheep per acre per annum. On May 4th, 158 ewes, with lambs, were pastured for 19 days. For 10 days of this last period they had the run of another small paddock, but as there was very little feed on it they fed most of the time on the sorghum. Moreover, as a setoff against this, a considerable quantity of sorghum was cut for the cows. For the whole period the crop carried sheep at the rate of three sheep per acre per annum. The value of the crop lies in the fact that it provides a good bulk of green feed at a time when natural feed is dry and scarce, and also when the young feed is starting and of little value for feeding. Also, in keeping the sheep off the other paddocks, one enables the young grass to get a start and keep sweet. Sorghum requires a good seed bed, and the land must be well worked to ensure a good germination. Once started it is very hardy, and stands any amount of hot and dry weather. It should be fed off the first time just as it is about to flower, at which period there is no danger of poisoning stock feeding on it. Since being fed off the paddock has been ploughed and drilled with wheat, and the crop looks very promising."

#### MINNIPA.

August 2nd.—Present: six members and visitors.

Mr. G. Lindquist read a paper, "The Life of the Wheat Plant," that had been contributed by the late manager of the local Experimental Farm (Mr. L. J. Cook). Mr. Lindquist read a paper, "Hand Feeding Sheep." At a further meeting, held on September 9th, the evening was devoted to the making of arrangements for the forthcoming Conference of Eyre Peninsula Branches, to be held at Minnipa on October 20th and 21st.

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## MOUNT HOPE.

August 13th.—Present: seven members.

**FENCING.**—In the course of a short paper dealing with this subject, Mr. J. H. Vigar said an ideal fence, where suitable timber was obtainable, could be constructed with split red gum posts, placed 12ft. apart and 18in. in the ground. The bottom wire should be 6in. above the surface of the ground, the next wire 5in. higher, the third 6in. above the second, and spaces of 7in., 8in., and 10in. between the top three wires. The top wire would, of course, be a barb. However, in that district only second-class timbers for fencing were available, and of them he thought the sheoak would give the best results. For a sheep-proof fence the speaker suggested the following:—Posts 12ft. apart, with holes bored at intervals of 7in., 6in., 6in., 8in., and 13in., using three plain and two barb wires. If time could be spared, he strongly recommended the charring of the ends of the posts that were placed in the earth. If one was erecting netting on "coasty" country, it was a good plan to immerse it in hot tar, to minimise the deteriorating action of the salt air. A good discussion followed.

## ROBERTS AND VERRAN.

August 15th.—Present: 11 members.

**LAYING OUT A NEW FARM.**—In the course of a short paper on this subject, Mr. H. M. Smith said the first thought of the new settler should be the selection of the site for the homestead. An ideal spot would be on a gentle rise on or near the centre of the block. The nature of the soil should be studied, with a view to laying out a garden. For that purpose both a good surface soil and subsoil was required, the former for flowers, vegetables, &c., and the latter for trees and shrubs. A portion of scrub should be marked out, and preserved as a breakwind for the homestead. About 10 acres would be required, and would provide sufficient room for laying out the garden and erecting the house, stables, implement sheds, &c. The stables should be erected about 200yds. from the house. The idea of placing the homestead in the centre of the farm was to have the work comparatively handy, doing away with undue loss of time travelling to and from the paddocks. With a little ingenuity most of the paddocks could be so laid out that some portion of it came near to the homestead. A few clumps of scrub should be left in each paddock for shelter for the stock. Should there be no water laid on to the farm, one of the first things to do would be to sink a dam or tank. In the discussion which followed, Mr. Geo. Drayton thought it a good idea to have the paddocks situated for convenient working. He favored having the homestead as near to the centre of the farm as possible. Water should be conserved close to the stables, eliminating undue loss of time travelling stock to and from water. Mr. A. T. Cowley advised having the homestead in a central position, surrounded by a clump of scrub for shelter. A few small feed paddocks should be handy to the stables, and water conserved in a convenient place. A little work spent in making a good track to the road was labor well invested. In his opinion the stables should be erected in the opposite quarter to the prevailing winds. That would prevent the swarms of flies and insects that invariably bred in those places from swarming around the house. The same should also apply to the erection of the cowyards, pigsties, &c., all of which should be not less than 100yds. distant from the house. For the more distant paddocks, he advised the constructing of races, thereby facilitating the removal of stock from one paddock to another. Mr. Masters thought it a good plan to excavate a water catchment, even though water was laid on to the holding. In the event of the supply becoming exhausted, a dam or tank would be sometimes filled by local showers. The speaker also found it a good idea to erect a race to the more distant fields. Mr. C. Kunst did not think it a good plan to have the homestead in a central position, because it was too far from the water main. A dam could be excavated in the middle of the farm, and teams could be watered there during work in the more distant paddocks. The roads made an excellent water run, and a great deal of water could be conserved by having a dam or tank close to the fence. He advised observing sanitary conditions, erecting stables, pigsties, &c., from 100yds. to 120yds. from the house. Mr. B. Evans advocated permanent improvements. Temporary fences, &c., caused a great deal of lost time

and trouble. In his opinion a dam should be sunk as soon as possible. Iron gates were more serviceable than barb wire gates, and more attractive. Mr. H. A. Simmons said the most important thing to study was economy. Temporary fences and buildings were responsible for a great deal of lost time and labor. Mr. Smith, in reply, adhered to his views on having the homestead in a central position. If the homestead was situated on one end of the farm, near the water main, time would certainly be saved in watering stock, but more time would be lost in going to and from work, the paddocks being further from the homestead. Also, it was possible to run a line of pipe from the main to the house.

### SALT CREEK.

August 10th.—Present: seven members.

**THE 10-FURROW DISC PLOUGH.**—In the course of a short paper dealing with this subject, Mr. W. H. Gale said the 10-furrow disc plough was the best implement he had ever worked in stumpy land. The draught was very light, and the furrows did not hang on the stumps. The implement ran very evenly, and kept to its course, thereby being much lighter on the horses than the other types of ploughs. The disc implement did an exceptionally good job on dirty land, and was responsible for cutting off a large number of mallee shoots. The one fault that he had to find with the machine was that the two hind axles were too light to carry the weight of the machine. The subject, "Fencing," was also brought before the meeting for discussion.

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**CRYSTAL BROOK & PORT PIRIE.**

YADNARIE (Average annual rainfall, 14.09in.).

August 16th.—Present: 14 members and three visitors.

**AFFORESTATION.**—Mr. W. E. Hier, who read a paper dealing with this subject, said before planting trees one should give consideration to the varieties suited to different kinds of soils. He believed the red gum would do exceptionally well in their district, as it made a strong growth when planted on a sandy loam overlying a good clay subsoil. The mallee was generally admitted to be a timber of very little commercial value, and, unfortunately, the natural scrub did not contain many trees of a useful nature, so that it behoved the farmer to plant trees that could be utilised on the farm. He suggested the planting of such trees as pines, oaks, and gums. If clumps of trees were planted in the corners of the paddocks, they would not interfere with the working of the land, and would prove very valuable, and in many cases provide a much needed shelter for the stock. In addition to that, the trees would in years to come be a valuable asset for use as timber for building and fencing purposes. Unless more care was taken of the timber, the time would come when farmers and other landholders would have cause to regret the thoughtlessness in destroying the trees. Members, in discussing the paper, upheld the views of the speaker. Mr. Dear said time spent in planting trees was time well spent, and farmers would be well rewarded for their trouble should they at any time wish to dispose of their holdings. In reply to a question from Mr. Forbes as to what was the best time to sow seeds of the trees, Mr. Way considered best results would be secured if the seeds were sown in February. Mr. Brown thought it best to plant in early winter. If the trees were obtained from the nursery, most success would be secured from those sent out in pots.

**CARROW**, August 18th.—Mr. Hawke delivered an address, "Bulk Handling of Wheat." A paper, "The Wheat Pooling System," was contributed by Mr. W. J. Boyce, and read by the Hon. Secretary (Mr. F. J. Ancar). In the discussion that followed, members were of the opinion that farmers would be best served by a continuance of the pool.

**EDILLIE**, August 27th.—The meeting was devoted to a discussion of tractors, and their suitability or otherwise for local conditions. Mr. Palm, who had attended the recent Yorke Peninsula field trial, was able to supply a lot of interesting and essential information. Members unanimously decided that tractors were not suitable under the conditions existing in that locality at the present time.

**GREEN PATCH**, July 18th.—After the usual business in connection with the annual meeting had been transacted, Mr. E. M. Sage read a paper, "Through Booking of Goods to and from Eyre Peninsula," in which he pointed out the disadvantages entailed in the carriage of goods under which settlers on the Peninsula were laboring.

**PETINA**, August 13th.—Matters in connection with the forthcoming Conference of Eyre Peninsula Branches formed the chief topic for discussion at the meeting. The Hon. Secretary (Mr. W. L. Schulz) presented the annual report, and the officers were elected for the ensuing term.

**SMOKY BAY**, August 13th.—The Hon. Secretary (Mr. J. W. Blumson) read an extract "Analyses of Soils." Matters relating to the forthcoming Conference of Eyre Peninsula Branches were also dealt with and the officers for the ensuing term were elected.

**TALIA**, August 13th.—Mr. P. A. Thomson read an interesting paper, "The Portable Engine on the Farm." Several matters in connection with the forthcoming Conference of Eyre Peninsula Branches were also discussed.

**WUDINNA**, July 9th.—Mr. A. W. H. Barnes contributed a paper, "Horse Breeding," and a lengthy and interesting discussion followed.

**WUDINNA**, August 18th.—An interesting address, "Co-operation," was delivered by Mr. Hogan, and a good discussion followed.

**YALLUNDA**, August 13th.—An interesting and instructive paper, "The Feeding of Sheep in Our District," was contributed by the Chairman (Mr. A. G. Price). Messrs. H. and E. Butler and W. Ahang were proposed as new members of the Branch.

YEELANNA, August 20th.—A short paper "Stack Building" was contributed by Mr. P. Wagner. Matters in connection with the Annual Conference of Eyre Peninsula Branches were discussed, and five members signified their intention of attending the gathering at Minnipa on October 20th and 21st, 1921.

## EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

### BORRIKA.

August 6th.—Present: nine members and visitors.

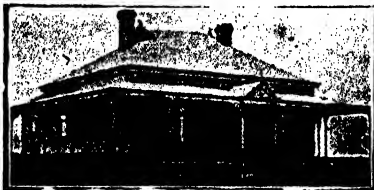
Mr. Dohnt read an article from the *Journal of Agriculture*, "Colt Breaking." In the discussion that followed, the speaker thought the young horse should be broken in to work in the shafts of the wagon. He was not in favor of the practice of petting the foal. Messrs. Tonkin and Green preferred to work the colt in a pair of chains attached to a light log. Messrs. Tonkin and Brown thought one of the most important points to be the moulthing of the colt. The election of officers for the coming 12 months' work concluded the meeting.

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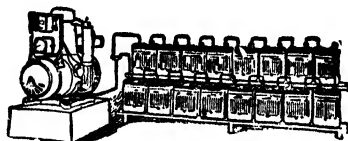
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## GERANIUM (Average annual rainfall, 16in. to 17in.).

August 13th.—Present: 17 members.

FALLOW.—A paper under the heading "Working of Fallow" was contributed by Mr. W. Pannell and read by Mr. Bridgeman. The paper read as follows:—The advantage of bare fallow as a preparation for the wheat crop is one of those things which farmers have learned in the hard school of experience. Whilst it is no doubt true that occasionally very good crops are harvested off the previous year's stubble, these chance crops will not induce any experienced farmer to abandon the well-proven system of "fallow." Probably one of the ideals of a good farmer is to make his land more productive every year, and keep it in good condition to grow good crops indefinitely. This ideal is perhaps one that a great number of mallee farmers fail to attain, owing largely to our natural handicaps. In the first place the farms are in a great number of instances too large; they are also inadequately subdivided by fencing, and the land for a number of years seems particularly prone to grow undesirable bushes and weeds. If the farms were smaller and subdivided into more paddocks, stock could be concentrated on to certain areas to keep these undesirable bushes and weeds in check, and convert them into manure. These conditions seem to affect the nature and quality of our fallow to a remarkable degree, in that the more rubbish that is ploughed into the ground the looser and drier the fallow remains instead of compacting into a solid seed bed, and thus one of the main objects of the fallow is defeated. Very few classes of soil, except poor sand, are actually deficient in plant food, so it would seem that the factor which limits productiveness is lack of physical fitness rather than lack of chemical content; and, if this true, then fallowing is the process to put that physical fitness into the soil. In a climate such as we have in the mallee, water is often the limiting factor in producing bigger crops; this is especially noticeable if a dry spell occurs between hay time and harvest. But fallow does more than store water in the soil. It puts the soil in that physical fitness so necessary for the active workings of the soil bacteria. When we consider that the super sown with the seed constitutes probably not more than 4 per cent. or 5 per cent. of the food eaten by the plants, it becomes clear how much more important it is to give the soil the proper and necessary working to allow it to supply the additional 95 per cent. or 96 per cent., and just so far as the farmer fails in his tillage methods just so far will he fall short of his full cash returns. As farmers, we should feed our crops as a dairyman feeds his cows, not merely to keep them alive, but to get the best possible returns. In mentioning that the super sown with the seed constitutes probably only 4 per cent. or 5 per cent. of the plant food, it is not intended to belittle manuring; in fact, it has been conclusively proved that heavier dressings of super are absolutely necessary if we are to secure heavier crops. At the same time liberal quantities of super put into land in an unfit condition to respond to it is largely wasted. I will leave the details of fallowing operations for discussion by the meeting, as I think it of greater importance in the first place to endeavor to establish underlying principles, but would suggest that all fallow should be completed not later than September, and thereafter worked in a damp condition as often as is found practicable according to class of soil and opportunity. In conclusion, the following points seem to me to merit our consideration:—1. The yield of the crop and cash profits depend on the quality of the fallow. 2. Larger yields depend on the discovery of the factors that at present limit productiveness. 3. Productiveness is limited by the factor which is most deficient. 4. The factor which is most deficient is physical fitness of soil. 5. Fallowing will put the soil in good physical condition by storing moisture, allowing the soil bacteria to create ample supplies of plant food, and making the land respond to artificial manures. 6. Good fallow is fallow done by September, and subsequently worked by the cultivator or harrows as often as practicable. 7. Poor fallow is the fallow that makes the poor farmer. Mr. Lithgow, who opened the discussion, said, "If fallowing is worth doing at all it is worth doing properly." One could not simply scratch the surface of the land with a disc implement, and expect to receive the same returns from a properly ploughed and fallowed paddock. He would not work the sandhills, as that was inclined to cause drift. Mr. Hughes could not agree with the latter statement; he believed it was better to root up the sandhills and plough out all the stumps. Mr. O. Lang agreed that the sandhills

should be worked. Mr. Jacob said he had learned from experience that it paid to sow wheat only on fallow land. Oats had to be sown in the mallee districts to help fight the take-all, but that crop could be grown on stubble land. He advocated the working of the sandhills. Messrs. Whittlesea, Lillecrappe, and Dohnt also took part in the discussion.

LAMEROO (Average annual rainfall, 16.55in.).

August 20th.—Present: 18 members and visitors.

INTERNAL COMBUSTION ENGINES.—The following paper on this subject was contributed by Mr. H. Ullricht:—The price of petrol and kerosine is still high, and will likely remain so for some time to come, therefore, it may be desirable to know how to economise in the consumption of fuels. The principal causes of an excessive consumption in petrol and oil engines are:—(a) Imperfect combustion; (b) faulty ignition; (c) bad compression. (a) An imperfect combustion is a slow burning of the gas, instead of an instant explosion, and is caused by either too weak or too rich a mixture. To form a high explosive charge it is necessary to have the exact proportion of air to gas. Another cause is a feeble spark. (b) A late ignition means a waste of fuel and insufficient power, because the piston is running away from the charge, instead of being driven, and is noticeable by excessive heat in the cylinder. With the ignition too early, the charge is acting partly as a brake, and can be observed by a dull knock in the cylinder head. A weak spark, even correctly timed and with a perfect mixture, will only cause a slow combustion. Pre-ignition may be caused by carbon in the cylinder head.

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MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

August 13th.—Present: 14 members.

**HINTS ON SOLDERING.**—The Hon. Secretary (Mr. C. F. Altmann), who contributed a paper on this subject, said soldering was a very simple job, providing attention was paid to the following two points—a clean soldering iron and a clean surface on the article to be repaired. To make the iron ready for use it should be heated, and if it was not pitted the scales and dirt should be filed off, and the tool then rubbed with salamoniac. When the iron commenced to sweat a piece of solder should be rubbed over the surface, which would result in a properly tinned soldering iron. Once the iron had been properly tinned and not overheated it would not require a retinning for some considerable time. If the iron was burnt and pitted to any extent it would be advisable to smooth its surface with a hammer. A file should not be used, as it took too much copper from the tool. When any soldering was being performed the iron should be dipped, after each heating, into a solution of salamoniac and water, when it would come out quite bright and clean. The success of the work depended very largely on having a clean surface to work upon, so that no pains should be spared in removing any grease, &c., from the article to be repaired. One should also be careful to avoid pressing the solder too heavily on the iron, as that would result in a very uneven surface on the tin. One of the members, in discussing the paper, said if a quantity of zinc was dissolved in spirits of salts, and the hot iron dipped into it, the iron would be as well tinned as it would be when worked up with salamoniac.

#### NETHERTON.

August 12th.—Present: 12 members and two visitors.

**CO-OPERATIVE PURCHASE OF A (STUD BULL.**—The Hon. Secretary (Mr. C. M. Wilkin), who contributed a short paper on this subject, said that as the dairy cows was one of the most important sidelines connected with the farm, it was necessary for the farmers to take steps to raise the standards of their milking herds. In the majority of instances the purchase of a high-class sire was beyond the means of the farmer, but he thought that they, as members of the Agricultural Bureau, might, by a system of co-operation, purchase a pure-bred bull for the use of the dairymen in the district. A very interesting discussion followed, considerable criticism taking place on the best type of animal for the district. On the matter being put to the vote it was found that most members favored the milking Shorthorn.

PINNAROO (Average annual rainfall, 16.74in.).

August 12th.—Present: 16 members and five visitors.

**FALLOWING.**—The following paper, under the heading, "Preparing Good Fallow," was read by Mr. Jas. Scates:—"The impressive advantage of systematic bare fallowing as a preparation for the wheat crop is one of those things which the Australian farmer learned in the hard school of experience. Tenaciously was the idea clung to that our seasons are so uncertain that wheat growing is essentially a gamble, but it is now widely recognised that the size of the yield and the profit as well is largely determined by the quality of the preparation given the soil. It is universally accepted that the best possible preparation for wheat is bare fallow,

which involves the careful treatment of smaller areas. It is true that many crops sown last year without fallow were a financial success, but the circumstances were most exceptional. Only as a temporary expedient for taking advantage of a favorable combination of business and meteorological conditions, or in pioneering new mallee is the practice justified. The occasional success of the stubble-sown wheat will not induce the experienced grower to abandon his well-tried fallowing system. Rather will it remind him of the fate of others who yielded to similar temptations in the past. To-day then, under all ordinary conditions it is not a question of deciding between two systems, but rather of determining the actual technicalities involved in the preparation and maintenance of the best type of fallow. The general object of a fallow can be readily stated—moisture is to be stored in the soil from one season to augment the supplies that fall in the next during the growing period of the crop. Extra plant food is to be liberated from the inert soil particles. Weed seeds are to be germinated and killed, and the type of environment that the roots of the wheat plant prefer, prepared. In addition, everything done must be in harmony with the orderly management of the farm. There is no hard-and-fast rule to be observed in regard to depth. Owing to the loose sandy loams found on most of the mallee country, I prefer not to plough to a depth of more than 3in. to 3½in., because, in the majority of seasons, great skill is required to consolidate the under layers sufficiently. Poor consolidation and the take-all disease go hand in hand. But while the practice of shallow ploughing is greatly superior to the old-style deep ploughing, we are told by experts that it places an unnecessary strain on the surface layers of the soil, and I note that a few of the most consistently successful farmers take the opportunity of ploughing the land to 4in. and 4½in. deep in any wet year. They rely on skilful management of cultivation implements and sheep to secure the necessary consolidation, and, as a rule, the same land would not be ploughed deep twice in succession. The

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secret in getting proper consolidation is in early ploughing and in the prompt treatment after rain, with shallow-working implements, such as the harrows and spring-toothed cultivator. Dependence for weed killing must be placed on implements such as the scarifier or skim plough. As far as possible each cultivation is made at right angles to the direction of the preceding one. The best farmers have come to recognise the fact that a judicious cultivation given to the fallow immediately after rain is worth a bushel or so more wheat per acre, yet if deferred a week or two, it may actually do harm. In some seasons as many as 10 or 11 cultivations are given by some farmers in the Lower North of South Australia and the Wimmera of Victoria. The object of the continual working is to maintain the surface mulch, to liberate plant food, and to effect judicious consolidation of the under layer, as well as to kill weeds. Thorough cultivation conserves moisture from one year to another, consolidates the soil, destroys weeds, and reduces the soil to fine particles so that the tender rootlets can forage for plant food. What prompted me more than anything else to write this paper is the fact that a large number of settlers in the mallee seem to think that so long as they plough up the land any time between seeding and the starting of the harvest, that they have fallow, and should get a good return from it the following year. But experience has proved again and again that such is not the case. I am firmly of the opinion that rather than fallow after the end of the present month, it would pay infinitely better to simply plough a fire break around the paddock, and burn off the grass after the following harvest, taking the advantage of working the ground shallow immediately after the first rains in autumn, and cultivating again at seed time. This will pay far better than bad fallow." In the discussion that followed, Mr. H. Ledger considered early fallowing, well worked, the best, especially if ploughed before seeding; but he did not agree with Mr. Scales in saying it was better not to fallow at all after the end of August. His experience was that one could fallow any time up to harvest, if the work was done after a good rain. He considered the working of the plough after, say,  $\frac{1}{2}$  in. rain to be disastrous to the crop. Mr. Roy Edwards agreed with the statement that early fallow was best, but considered seasonal conditions governed the date by which the ploughing should be finished. He thought September was not too late if the subsoil was really wet. Mr. J. G. Fisher strongly supported Mr. Scales' contention that only early fallow was, in the long run, successful. He also contended that the ploughing in of grass and other rubbish was a mistake. Mr. F. G. Bonnin thought that the success of early and late fallow largely depended on the season. If a really good rain fell after the ground was fallowed, all would be well. Mr. W. B. Davis indorsed the opinions expressed in the paper. He could not say much about their district, as he had only recently taken up land at Pinnaroo, but he had noticed that where good fallow was seen in 1920, one heard of good harvest returns, and where he had seen bad work people had complained of poor results. Mr. E. H. Parsons then read a paper dealing with the technical side of the subject.

#### TAPLAN.

August 20th.—Present: 10 members and visitors.

**POWER ON THE FARM.**—Mr. F. McMillan, who contributed a short paper dealing with this subject, said the question of power on the farm was daily becoming a more important point to the agriculturist. Great strides had been made with harvesting machinery, but no great improvement had been made with the ploughing implements, with the exception that nowadays the farmers worked machines with a larger number of furrows that required more power. Neither had the acreage per day per furrow increased. The tractor might improve the acreage in some districts, but for their localities he did not think the tractor could be worked with any beneficial results. The paper concluded with an extract from the *Journal of Agriculture*, written by the Director of Agriculture (Professor Arthur J. Perkins), dealing with motor tractor trials at Turretfield. Messrs. Voglesang and Hammond discussed the paper, and expressed the opinion that up to the present time the tractor could not be considered an all-round implement for farm work. The annual election of officers then took place.

**WILKAWATT** (Average annual rainfall, 16in. to 17in.).

August 20th.—Present: eight members and visitors.

**WHEAT SELECTION.**—In the course of a paper dealing with this subject, the Hon. Secretary (Mr. A. B. Neville) said wheat selection as an aid to increased yields should be carried out by the farmers, and especially those situated in the mallee areas of the State. The conditions in those districts were such that the wheat plant had a tendency to deteriorate. That was proved by the many different varieties of wheat that had been grown in the mallee for a few years, and then cast out as being poor croppers. He believed if they were to practise wheat selection such would not be the case. Grading as a means of keeping the wheat up to standard was no doubt beneficial, but it was not sufficient to ensure greater yields. Two or three varieties of wheats that were known to give good returns should be sown, and a selection made from plants true to type that grew well-filled heads. Such a practice would produce more even crops, and eliminate many of the "dummy heads" from the wheat crops.

**BERRI**, August 16th.—Mr. H. Levein delivered an address dealing with the subjects, "Pruning, Green Manuring, and Chemical Fertilisers." The presentation of prizes and certificates won at the Berri Pruning Competition also took place, and it was decided to request the Advisory Board to make the river pruning competitions an annual fixture.

**CADELL**, July 14th.—The Manager of the Berri Experimental Orchard (Mr. C. G. Savage) attended the meeting and delivered an address, "The Pruning and Trellising of the Vine." Mr. V. Cock (District Irrigation Officer) was also present, and spoke on the benefits to be derived from co-operation. On July 15th Mr. C. G. Savage gave a pruning demonstration.

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**GLOSSOP**, August 17th.—Mr. W. E. Muspratt (Irrigation Instructor) delivered an interesting address, "Rack Building," and replied to a number of questions.

**KINGSTON-ON-MURRAY**, August 18th.—An article from the *Journal of Agriculture*, "Benefits to be Derived from Membership of the Agricultural Bureau," was read by Mr. J. Wetherall, and an interesting discussion followed.

**LOXTON**, August 24th.—After having been in recess for a number of years, a meeting of the above Branch was held for the purpose of discussing the best means of awakening fresh interest in the work of the Bureau. Members expressed themselves as anxious to keep the Branch going, and officers for the coming year's work were appointed. Messrs. Traeger and Thiele were elected to represent the Branch at the Annual Congress.

**MOOROOK**, August 26th.—Members were very appreciative of the interesting address given by the Hon. Secretary (Mr. S. Sanders, jun.) on the subject, "Spraying." A practical demonstration of the mixing of the spraying compounds was given by the speaker.

**MURRAY BRIDGE**, August 16th.—An address, "Mixed Farming," was given by Mr. H. B. Kuehel, and an interesting discussion followed.

**RAMCO**, August 15th.—Several matters of local interest were brought before the members for discussion. Mr. F. G. Rogers was appointed a delegate to represent the Branch at the forthcoming Annual Congress.

**YOUNGHUSBAND**, August 16th.—After the Hon. Secretary (Mr. W. G. McNeil) had presented the annual report, and the officers had been elected for the ensuing year, the meeting took the form of a social entertainment, and a very enjoyable evening was spent.

## SOUTH AND HILLS DISTRICT.

**GUMERACHA** (Average annual rainfall, 33.30in.).

August 15th.—Present: 11 members and visitors.

**CULTIVATION OF FODDER CROPS.**—Mr. F. M. Lee, who contributed a paper on this subject, remarked that on too many farms the cows had to rely almost solely on the natural herbage for their food. That was a great mistake, because there was only a short period of the year when there was an abundance of green feed. Even when the cows were carefully fed with bran and chaff the results were not so good as when the animals had access to succulent green feed. There were several good fodders, such as lucerne, berseem, and Sudan grass, that could be grown for the stock during the dry months of the year. Lucerne was not entirely suited to their district, because of the cold and wet climate, but he believed that with careful cultivation profitable crops could be grown. Berseem should be sown either during the autumn or spring, but to ensure success it was necessary to have a sure supply of good water. With land of a good quality and sufficient moisture in the soil to germinate the seed and keep it growing during the early stages of the plants, Sudan grass was a crop that would, in a few weeks, yield a heavy crop of green fodder that could either be cut or grazed. The latter point gave the Sudan grass a decided advantage as a fodder crop over many other plants. As a milk producer the speaker considered it equal to lucerne, and it was an excellent crop for fattening stock for market. Owing to the very succulent nature of Sudan grass he considered it a success to cut it for hay. The seed could be sown as soon as the danger from frosts was past at the rate of, say, 7lbs. to 10lbs. per acre, and the plants would be ready for grazing at the end of January. Mangolds were a profitable crop for feeding to pigs, but for other classes of stock he did not think they would pay. Maize when cut at the right stage was an excellent fodder, but it could not be regarded as a crop to feed for increased milk production. Rape was a good fodder crop for sheep, but it should not be fed to dairy cows, as it was inclined to taint the milk. Land intended for barley or rye should be heavily manured to force the crops along. He believed it would be a profitable undertaking to sow a paddock with barley and allow the pigs to graze it off. It was his firm conviction that if fodder crops were grown systematically in their district the stock-carrying capacity of the land would be increased twofold.

**LENSWOOD AND FOREST RANGE (Average annual rainfall, 35in. to 36in.).**

June 11th.—Present: six members.

**CLEARING STRINGY BARK LAND.**—In the course of a paper dealing with this subject Mr. W. McLaren said if the timber was green, the trees should be cut down, leaving a butt 2ft. or 3ft. above the surface of the ground. The best of the trunk could be carted to the timber mills, and the tops thrown together and burnt. When the land had received a good soaking a hole should be bored with a 1½in. auger in the bottom of the stump, and a charge of explosive then placed in the hole; One pound of the explosive that he had used had been sufficient to lift and split a stump 15in. in diameter. For exceptionally large stumps the speaker suggested inserting several charges under the base of the lower roots, and then firing them with an electric battery. If the stumps were then left until the following winter two men working with a stump pulling machine would pull the stumps out fast enough to keep one man engaged in putting the rope on the stumps as they were to be pulled out and knocking the dirt off those that had been extracted. If the timber had been rung and left standing for a number of years the trees could be pulled down, but in the case of very large trees he believed the best proposition would be to pull them and shoot the stumps. The final operation was the working of the land with a reversible disc plough and a good set of harrows. At a further meeting held on July 23rd, the officers were elected and a programme of meetings was compiled for the ensuing six months.

**ROCKWOOD.**

August 15th.—Present: 17 members.

**FARM MACHINERY.**—Mr. P. C. Henley, who contributed a paper on this subject, said farm machinery was one of the most important adjuncts of a modern farm, and the man on the land should give the implements proper care and attention.

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When the implements were being purchased he believed it was best to secure machines with as little wood in them as possible, because there was very little danger of the iron deteriorating to the same extent as the wood. Referring to ploughs and harrows, which were manufactured entirely from iron, the speaker did not think they required to be kept under cover; but it was a good plan to occasionally give them a coat of paint, and to see that the nuts and bolts were screwed up tightly. When not in use the seed drill should be kept in a shed. If the drilling was held up by rain, and the machine left out in the paddock, it was advisable to place a cover over it. The binder should also be put in the shed immediately after it had finished cutting hay. It was important that the canvas elevators should be taken off the machine and rolled up, and put away in a dry place. The harvester, if not properly looked after, and worn parts replaced with new ones as occasion demanded, would give a considerable amount of trouble in the field, and result in a good deal of grain being wasted. The oiling of the different parts of the machines was also a factor that played an important part in the life of the implements, and the farmer should see that oils and greases of the proper grades were used for the bearings, cups, cylinders, &c., of the machines. Referring to the building of the sheds for the housing of the implements, the speaker favored a structure built of stone and iron, because it did not provide a nesting place for birds. An interesting discussion followed, in which Messrs. H. Dunn, J. Steed, H. Green, S. Collett, H. Simmons, and J. J. Bradford took part.

**ASHBOURNE**, August 22nd.—Mr. C. H. Beaumont (Orchard Inspector) visited the Branch, and delivered an address, "Fruit Culture." Excellent samples of home-dried fruits were tabled by the lecturer.

**BLACKHEATH**, August 19th.—The meeting took the form of a "Question Box" evening, when several subjects of local interest were brought before the meeting for discussion.

**KANMANTOO**, August 13th.—Correspondence dealing with the activity of Bureau work in this Branch formed the principal item of discussion. Members were unanimous in the hope that the Branch would resume operations again, and it was thought that by holding meetings alternatively at Bondleigh and Kanmantoo the membership would be sufficiently increased to enable the Branch to be carried on successfully. It was decided to invite an officer of the Department of Agriculture to deliver an address on "The Work of the Bureau."

**LENSWOOD AND FOREST RANGE**, August 20th.—The meeting was devoted to a discussion on the subject, "Destruction of Noxious Weeds." The following dates of meetings for the year ending December, 1921, were selected:—October 17th, November 14th, and December 10th.

**LENSWOOD AND FOREST RANGE**.—The following programme of meetings for the period ending December, 1921, has been received from the Hon. Secretary of the above Branch:—October 17th, five-minute speeches by members on any subject of interest; November 14th, "Inspection of Orchard," Mr. F. Hackett; December 10th, "Inspection of Experimental Plots," H. H. Schulz's orchard. Meetings held fourth Saturday in the month.

**MACGILLIVRAY**, August 19th.—The monthly meeting of the Branch was held at Mr. R. Wheaton's homestead. The question, "Destruction of Noxious Weeds," was considered, and Mr. Wheaton was appointed to represent the Branch at the Annual Congress.

**SHOAL BAY**, August 18th.—The subject, "Noxious Weeds," was brought before the meeting for discussion, and the officers for the ensuing 12 months were elected.

**STRATHALBYN**.—A programme of meetings, as outlined hereunder, has been arranged by the above Branch:—October 18th, papers by Messrs. J. Saunders and H. Eckert; November 15th, papers by Messrs. G. J. Springbett and H. W. Trowbridge; December 13th, address by Mr. P. H. Kilaby, followed by a social; 1922—January 17th, papers by Messrs. H. H. Butler and H. V. Hopkins; February

14th, papers by W. H. Cuming and F. Abbott; March 14th, Milang Branch, followed by a social; April 11th, papers by Messrs. J. Mac. Cheriton and F. G. Abbott; May 9th, papers by Messrs. S. Bottrill and E. Saunders; June 13th, annual meeting and social. Night of meeting, Tuesday, on or before full moon.

### SOUTH-EAST DISTRICT.

GLENCOE (Average annual rainfall, 33.84in.).

June 15th.—Present: 10 members.

**THE KITCHEN GARDEN.**—Mr. W. Sims delivered an address on this subject. The speaker first of all dealt with onion growing, for which he preferred a soil of a light friable character. The crop could also be grown successfully on heavy land, but on such soil it was as well to use a liberal application of cow manure. He had grown white Spanish and brown globe varieties, and thought it better to purchase the plants rather than raise them from seed. The plants could be set out in rows 12in. apart with 6in. between the plants. If the bulbs were hung up in a dry and warm place they could be stored for a considerable period of time. Giant and crow's foot rhubarb had given good returns when planted 3ft. 6in. apart. Pig manure should be applied to the land intended for the rhubarb, as that fertiliser did not attract worms like horse manure. For the growing of pumpkins he suggested digging a trench 4ft. or 5ft. wide and 2ft. deep, and then working in plenty of cow manure when filling in the trench. Watering should be carried out during the summer months, but it was necessary to exercise discretion, as too much water affected the keeping qualities of the pumpkin. Carrots and

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parsnips grew best in a sandy soil. They required deep cultivation, and grew best when planted during August and September. If peas and beans were sown early they could be grown between the fruit trees. The trees would protect them from frosts, and they would come into bearing before they were likely to interfere with the fruit crop. Drumhead cabbages were a profitable crop to grow, not only for table use but also for cow feed. They should be planted out in November. He found that the purple top and white stone varieties of turnips did best in that district. Mr. T. Gratwick asked members what quantity of oats they thought should be sown per acre. Mr. W. Sims and Mr. J. Dow always used 2 bush. per acre, but Messrs. Holloway and Ferguson considered 1½ bush. of good clean seed sufficient.

#### MILLICENT (Average annual rainfall, 29.25in.).

August 6th.—Present: seven members

**TREE PLANTING.**—Mr. H. F. L. Holzgreffe, in opening a discussion on the subject, "Tree Planting on the Drainage Areas," said in the early days of settlement on the Millicent flats tree planting was generally regarded as a hopeless proposition, owing to the natural conditions of the locality. He had, however, proved on his property that such was not the case. He had first planted a number of blue gums around his home, but after reaching a certain age they did not thrive very well. The same could be said of the Remarkable pine, which was more suited to lighter soils. He had found that sheoaks, wattles, and yak gums did remarkably well, and they now provided a useful supply of firewood for the home. The wattles grew very quickly. Cluster pines were also well adapted to the flats, and were valuable for shelter and timber. The weeping willow, for shade purposes, was very hard to beat. Young red gums, taken from their natural home in the hundred of Kennion and planted on his farm, had now grown to useful trees. The establishment of orchards on the drained land had also been regarded as waste of time, but time had proved the error of those opinions. Mr. Holzgreffe advised planting a small area with suitable trees each year. It would prove a good investment, providing shade, shelter, and timber, besides adding beauty to the appearance of the homestead. Mr. Haines mentioned that stoned fruits such as peaches, &c., required a comparatively dry soil. Mr. Mullins said he quite agreed with the principles advocated by Mr. Holzgreffe. There was, however, a considerable difference in the suitability of the land on the flats for tree growing. On the heavy black soil it was extremely difficult to get trees to grow. At his home he had planted hundreds of them, and had used every endeavor to get them well established, but had not been very successful. Mr. Bell said the cluster pine did not make a vigorous growth on his land, but a clump of basket willows had grown to splendid trees. Mr. Hutcheson said the difficulty was to get trees through their early days of growth. There was no doubt as to their value on the exposed flats.

#### MOORAK.

August 18th.

**IMPROVEMENT OF HERDS.**—Mr. G. Dickson read a paper on this subject. He suggested that as the dairy industry played a big part in the State's welfare the Government should breed and sell high-class bulls at a reasonable figure. He favored many breeds, including Milking Shorthorns, Friesians, Red Poles, Ayrshires, and Jerseys. Mr. H. Buck said he thought a better scheme would be for a few settlers, as a syndicate, to buy a bull for themselves. Mr. J. L. Heaver thought the Government would assist settlers to purchase a bull, and Mr. W. A. Palamountain supported. Mr. O. Rehn thought that as the scheme would be a big undertaking to the Government, a better deal could be made privately where the owner naturally took interest in procuring the best progeny to breed from. Mr. J. Nicholls favored Mr. W. S. Kelly's idea of the registration of all bulls.

#### MOUNT GAMBIER (Average annual rainfall, 32in.).

August 13th.

**FLAX GROWING.**—The Hon. Secretary (Mr. D. A. Collins) reported that he had received a communication from a Melbourne firm, asking the landholders in the Mount Gambier districts to undertake the growing of flax. The correspondence pointed out that the firm was prepared to establish a mill if 400 acres were devoted to flax growing and if the crop was up to standard quality and reached

a stand of 2ft. to 2ft. 6in. After a lengthy discussion, the matter was postponed until a further meeting, in order to allow the Hon. Secretary to obtain the view of the other Branches in the South-East.

**PENOLA** (Average annual rainfall, 26.78in.).

September 3rd.—Present: nine members and visitors.

**MANAGEMENT OF THE FARM FLOCK.**—The following paper, under the title, "Sheep Raising," was contributed by Mr. W. A. Clifford:—For this district I think the Merino is the most profitable sheep to breed, especially as their fleeces command a higher price in the market than crossbred or Lincoln wool. One should secure a class of Merino ewes as even as possible, with large frames, straight backs, and round bodies. The skin should be pink, and the sheep healthy. Avoid ewes with wrinkles all over their bodies, as they collect grass seeds, and the wrinkles greatly detract from the value of the sheep and wool. Secure rams from a good stud breeder. I prefer large-framed and plain-bodied Northern rams, for although their wool is fairly strong, it will become finer after being in the South-East for a while. If early lambs are desired, it is necessary to mate the rams early in January, so that the ewes will lamb in May and early June, that is, before the very cold weather sets in. It is advisable to save some paddocks for early lambing, otherwise, in the event of late rains, there will not be sufficient feed to supply the milk, and the lambs will not make a rapid and healthy growth. I have had most success by mating the rams about the end of March, and taking them from the ewes about the middle of May. Two per cent. of fairly young rams will be necessary in order to get all the ewes in lamb. They will then commence to lamb the latter part of August, and with an ordinary South-Eastern winter there should be plenty of green feed for them. Endeavor to keep the ewes on grass pasture as much as possible while carrying the lamb, as scrub is not good for the milk, neither can it be recommended for the development of the embryo. It is necessary to keep the ewes in the best of condition. Breech all the ewes about six weeks or a month before lambing, and much will be done to prevent damage from blow flies. The best results can be obtained by going around the ewes every day during the lambing season. If one ewe is down with a live lamb, it is always a trouble to get her to take it. Some breeders have small yards, which can be carried on horseback, and when they get a sheep down that will not mother her lamb, they yard them for a day. Crows are a trouble while the ewes are lambing, especially if dead sheep are left in the paddock. Two years ago they were very bad in my flocks, and nearly every sheep found down had one eye picked out, blood poisoning would frequently set in, and the sheep would die. I tried poison for these pests, but had more success with the gun. I carried the gun on horseback, and shot dozens; the rest became frightened, and disappeared. Foxes can be destroyed with poisoned parrots. I do not like using meat, as there is always a danger of dogs picking up a bait, but they will not eat birds. I always take dogs when going around the ewes. They are very useful, and the sheep get accustomed to them. When the lambs are about a month old they are ready for marking. I prefer the knife for tailing. The clean cut heals more quickly than the wound made with the searing irons. The latter often festers, and remains sore for weeks. Put the ewes and lambs into as fresh paddock as soon as possible after lambing. I think it better to shear all lambs, for they do not collect as many grass seeds, and the flock will look more even if all are shorn. In the discussion that followed, Mr. Adamson favored early lambing, on account of the uncertainty of late feed. Mr. Fullerton was in favor of late lambing. Mr. J. Ricketts expressed the opinion that if 400 lambs were to be bred, he would breed half early and half late. Mr. McWaters said late lambs were best, and he preferred Merinos. He expressed a preference for comebacks on small holdings. Mr. Kidman said the late lambs were very hard on the ewes when the feed had become dry. Mr. Hinze said that if dead carcasses of lambs, &c., were buried, crows would not worry the sheep.

**KEITH, August 6th.**—An interesting and instructive evening was spent in receiving from Mr. A. Densley the report of the Short Course for Farmers, recently held at the Roseworthy Agricultural College.

**KONGORONG, August 18th.**—The Field Officer of the South-East (Mr. E. S. Alecock) attended the meeting, and delivered an address, "Fodder Crops for Dairy Cows."

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T. PASCOE,  
*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### Potatoes as Stock Food.

The Director of Agriculture (Professor Arthur J. Perkins) has supplied the following information in respect to an inquiry, first, as to whether raw potatoes are as beneficial as cooked for pigs; and, secondly, as to whether potatoes are milk-producing when fed to dairy cows:—Raw potatoes are not very popular with livestock feeders; they are said to lead to colic, and, at times, even to abortion. They are supposed to be particularly objectionable in the case of pigs, hence the usual recommendation to feed them cooked. In any case, the use of potato sprouts should always be avoided, since, at this stage, as with the green potato, they are more or less poisonous. (2) Raw potatoes are sometimes fed sliced to cows in milk up to a maximum of 25lbs. per day for an averaged-sized cow (1,000lbs.). If they are not used to potatoes, the latter should be supplied gradually and with great care. Unsound, damaged, or sprouted potatoes should be avoided. Potatoes are milk-producing in the sense of supplying protein like bran. They supply an essentially watery, starchy food material, and, as such, should be used in conjunction with dry food-stuffs rich in protein. They should not be used in conjunction with ensilage. For a 1,000lb. cow, yielding 2galls. of milk, the following is suggested as a suitable ration:—Potatoes, 25lbs.; wheaten chaff, 6lbs.; lucerne hay, 6lbs.; bran, 6lbs.

### Takeall.

With the object of assisting the Vegetable Pathologist (Professor T. G. B. Osborn, D.Sc.) in an investigation of the Takeall diseases of wheat, Branches of the Agricultural Bureau have been requested to ask their members to forward to that officer samples of wheat, oat, or barley plants, including roots, from any takeall patches on their holdings. Specimens of any weed grasses, such as drake, barley grass, etc., have also been asked for. Forms have been supplied, and on these growers have been asked to set down the following particulars:—Name of crop; variety; date cultivated; date sown; manure used (kind and quantity); area of crop; approximate area of crop affected; is the disease more marked in special places, such as hollows, rises, &c.; date on which the crop was first noticed to be affected; nature of soil, (i.e., clay, sandy, &c.). Previous history of paddock carrying the infected crop:—In 1918 it was sown with; in 1919 it was sown with; in 1920 it was sown with. General remarks:—(Include under this heading observations on any aspect not dealt with in the above questions).

## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"J. R.," Myponga, asks cure for bull infested with lice.

Reply—Tobacco, kerosine, and soap should be an effective dressing, but you did not state the amount of water with which it was diluted. Whatever dressing is used it must be repeated two or three times at intervals of 10 days to a fortnight to destroy the parasites which hatch out after the previous dressing. You can repeat the tobacco, kerosine, and soap wash, diluting with 2galls. of water, or you can use any of the following dressings:—Kerosine emulsion, made by dissolving  $\frac{1}{2}$ lb. soap in 1gall. of hot water. Add  $\frac{1}{2}$ pt. of kerosine and mix thoroughly. Creolin, kerol, or izar, or Cooper's milk oil fluid are all effective. Use one part to 40 of water (one tablespoonful to a pint). Dress the whole of the body. Repeat as directed. Choose a warm day for dressing, but do not expose to the hot sun.

"W. S.," Port Lincoln, has filly with a growth on the side of the tail the size of an emu's egg.

Reply—This growth should be completely removed with the knife. If it is on the lower part of the tail the best method would be to dock the tail at the joint immediately above it. If it is on the upper part of the tail it should be carefully and thoroughly dissected away from the surrounding tissues. Pigmented tumors in this region are very common in grey horses.

"W. J. F.," Manoora, reports dog recently recovered from distemper, but is still very weak in the hindquarters.

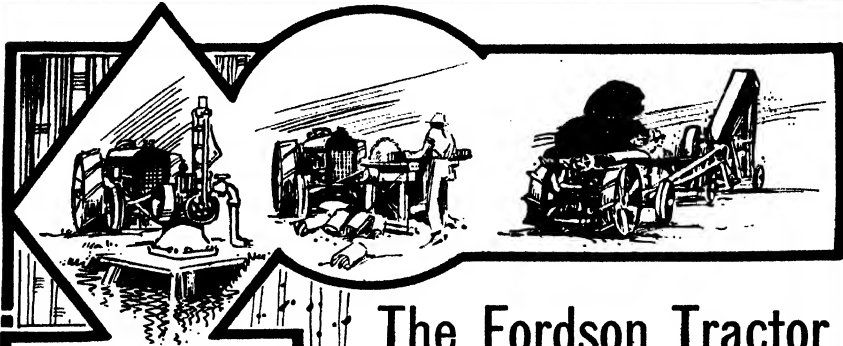
Reply—These symptoms do not respond readily to treatment, and are often incurable. Try iodine of potash, 5grs. twice a day. Give this dissolved in a little milk.

"C. V. B.," Wilmington, reports cows very stiff in the hindquarters and joints of the legs.

Reply—I advise you to give each animal affected half a teaspoonful of powdered nux vomica mixed with a little treacle twice daily on the tongue for a week. Feed them salt and bonemeal equal parts in the form of a lick. If they will not take it in this form give a small handful of each daily in the feed.

"Mrs. M. C. M.," Marmon Jabuk, reports heifer after being in milk for four weeks a lump formed in each of two teats, close to the udder. The lump prevented the milk flow.

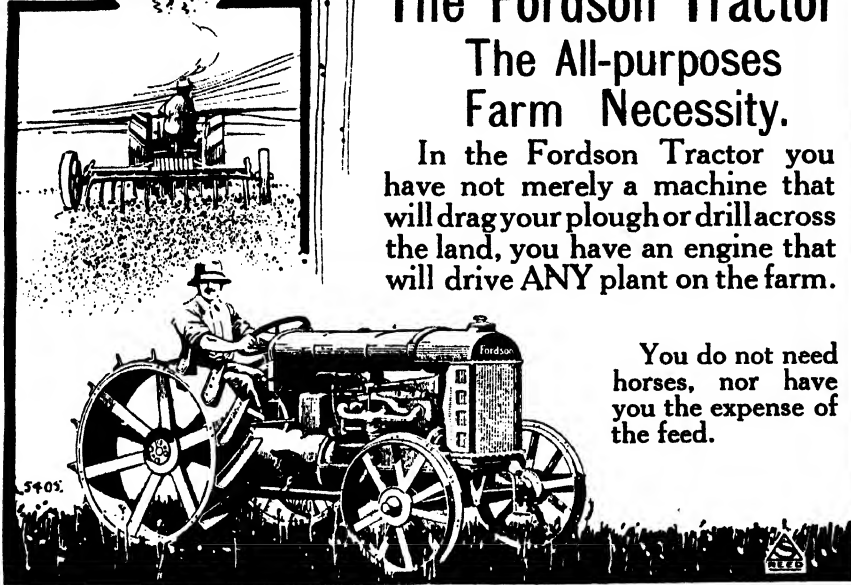
Reply—It would appear that she has had mammitis in the two quarters, possibly following the trouble in the teat, or perhaps infection following frequent insertion of the milking tube. It is not unusual to get contraction of the teat in mammitis. Apply fomenta; give plenty of gentle hand rubbing. Use camphorated oil after thoroughly drying. Milk as thoroughly as possible. If you are unable to do this by hand you should be able to get a milking tube of sufficiently small calibre to enter the duct. This must be boiled for five minutes each time immediately before using. It would appear that the heifer will not make a satisfactory milch cow, and you should consider the advisability of fattening for the butcher.



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"A. S.," Arkaba, has colt four years old with a muscle slipped from the shoulder blade. This has left a large depression in the shoulder.

Reply—I do not think it would be advisable to work him until the shoulder has filled up to some degree. If he is not lame now it may be assumed that the muscles will gradually regain their normal condition. Slipped shoulder is the term applied to a sprain of certain muscles of the shoulder, which in this case allow of an abnormal movement of the joint. This trouble is followed by considerable wasting of the muscles, and is a reasonable explanation of the condition of the shoulder of the colt.

"C. M. H.," Black Springs, has heifer first time in milk, with very hard front teats. When stripping blood is discharged.

Reply—This heifer has mammitis in both front quarters. Foment with warm water. Give the quarter plenty of gentle hand massage. Strip out thoroughly and frequently. Dry well and apply a little camphorated oil.

"W. H.," Redhill, has mare with sore heel. The heel appears to be decaying, and is swollen. Two holes can be noticed running parallel with the sole of the foot.

Reply—She is affected with thrush. You should keep her in a dry and clean stable. Have her shod so that she gets frog pressure. Apply dry calomel, dusting the part well with this daily.

"H.T.D.," Cadell, reports horse continually biting himself and rubbing against the rails of the stable.

Reply—He probably has mango. You should apply lime and sulphur wash, which is made as follows:—Mix  $\frac{1}{2}$  lb. of sulphur, 1 lb. of quicklime in a gallon of water. Simmer this over the fire for a few hours. Allow it to stand over night. Pour off the clear yellow fluid. Make up to one gallon by adding water (reject the sediment). Apply the wash by means of a swab. You can dress the whole body with the wash, but choose a warm day for dressing. Reapply in a week or 10 days.

"W. D. M.," Yeelanna, has pony, seven years, lame in the near shoulder.

Reply—He has a sprain of the shoulder muscles, commonly known as shoulder slip. This form of lameness is followed by considerable wasting of the shoulder muscles. Long continued rest is necessary. Swimming in a dam is not advisable. Turn him out for three months.

"H. T. S.," Murat Bay, reports death of foal after suffering three days with scours.

Reply—Death was due to infection through the navel. The most important preventive measure consists in providing a clean grass paddock for the mare to foal in. Once infection has occurred it nearly always ends fatally. (2) Inquirer also asks cure for dog with distemper. Reply—Give quinine sulphate 2grs. in pill twice a day. Good nursing, isolation, and the provision of nutritious easily digested food are also important.

"H. A. T.," Mount Bryan East, reports mare nine years that has been scouring for six weeks.

Reply—It is probable that she has some serious organic disease, of which the diarrhoea is only a symptom. Keep her in a loosebox. Rug her when the weather is cold. Take the chill off her drinking water. Give her linseed tea to drink, *ad lib*. Give the following medicine:—Chlorodyne 1oz., prepared chalk 1oz., in half a pint of lukewarm water twice a day. Feed her carefully small amounts at a time, and do not give her green feed.

"J. B. T.," Borrika, has mare eight years old falling away in condition. Animal has a "tucked-up" appearance, and is very stiff in all joints.

Reply—I advise you to put her on Fowler's solution of arsenic, one tablespoonful twice daily in the feed for a fortnight. Feed her liberally. Examine the teeth for dental irregularities. Examine the droppings from time to time for worms.

"J. T. P.," North Yelta, has pony in fat condition, walks as though very tender-footed. Short rings are noticeable on the hoofs.

Reply—This pony has subacute laminitis (founder). This disease of the feet is common in fat ponies, and the rings on the hoof are due to the disease, and not to defective shoeing. It will help considerably if you can reduce his condition,

as the weight he is carrying on his feet adds considerably to his discomfort. Feed him carefully. With regard to exercise you must use some judgment, as you will bring on an acute lameness if you overdo it. If you can reduce his condition and have him shod in rocker shoes it should improve his gait considerably. The tenderness may be relieved by standing him in cold water up to the fetlock for two or three hours a day after removal of shoes.

"D. N. W.," Mount Barker, and "F. W. N.," Lucindale, report the presence of grubs in the skull of a fat sheep.

Reply—These grubs are the larvæ or "bots" of the sheep nasal fly (*Oestrus ovis*), which deposits her eggs, or in some cases the larvæ, on the nostrils of sheep. The young larvæ make their way up the nostrils and locate themselves in the hollow cavities of the skull, where they remain for about 10 months, the favorite position being at the base of the horn cores. When ready to undergo the next stage of their life history the "bots" leave the skull and turn into the pupa or chrysalis on the ground. The expulsion of the parasites is assisted by the act of sneezing. After the lapse of a few weeks the adult fly emerges, and the female deposits her eggs as already described. This parasite has become quite common all over the State. If few in number they do not cause any serious harm, and those sent for identification are usually from fat sheep killed for mutton. If, however, they are numerous there is, especially towards the summer (when the "bots" are fully developed), irritation, discharge from the nose, sneezing, and loss of condition.

## DEPARTMENTAL DOINGS.

### AGRICULTURE, ETC.

The Director of Agriculture (Professor Arthur J. Perkins) during October visited Balaklava, and addressed the local Branch of the Agricultural Bureau, and also attended the Conferences of Eyre Peninsula and Murray Mallee Lands Branches respectively.

### DAIRYING.

The Assistant Dairy Expert (Mr. H. J. Apps) visited suburban dairies, addressed the Murray Bridge Branch of the Agricultural Bureau, and High School, and the Conference of Murray Mallee Lands. He also visited Kadina.

### GENERAL.

The Secretary Advisory Board (Mr. H. J. Finnis) visited Balaklava and Strathalbyn, and attended Conferences at Longwood, Minnipa, and Karoonda.

### POULTRY.

During the month the Poultry Expert visited Balaklava, Moonta, Grange, and Seaton Park, and inspected the poultry plants in the district. He lectured before the Waikerie and Mintaro Branches of the Agricultural Bureau.

### BUILDINGS, ETC.

The Field Engineer (Mr. J. Paull) lectured on "Concrete Tanks and Silos" before the Mount Barker Branch of the Agricultural Bureau. He also prepared plans for drains to remove floodwaters from the holdings of Messrs. Wright, Giles, Mayfield, Storr, and Cousins, of Booborowie.

## BETTER SIRES, BETTER STOCK.

[By FRAS. EVELYN PLACE, B.Sc., M.R.A.S.E., B.V.Sc., M.R.C.V.S.  
Roseworthy Agricultural College].

"Better sires, better stock, eliminate the scrub sire" is a popular cry just now, for lately South Australian breeders have been severely criticised by high authorities on account of the relatively poor results of their operations. On the other hand, the production of Commonwealth champions, breaking records in milk and wool, show that both the material and the men to handle it are to be found in this State. So the question naturally arises, "Where does the mistake lie?" that evokes the caustic criticism of three-cornered cows and nondescript horses. There are many factors that combine to produce these unhappy results, and it is to be feared that the animals are not alone blameworthy for they have not the choice of their surroundings and the men who breed them must take their share of the blame. It is easy enough to raise the cry "Eliminate the scrub sire," and, welcome as that step would be, it is only one factor in the improvement of stock. It is equally necessary to eliminate the man who is satisfied with the scrub sire, because, before a steady improvement in stock-breeding can take place, it is necessary to have a national stock conscience and a desire to possess nothing but the best. These two points are illustrated by history. For nearly two centuries England has been the mart for thoroughbred stock, a long enough time to set her competitors up in business, and yet to-day, when a foreign country wants to improve its stock, its agents are sent to England to buy, and though they take away the best, it is very seldom that England has to buy back from them, and it is very satisfactory to note that when such a step is necessary Australia has a "Carbine" to dispose of.

Elimination is, to a large extent, a negative method, and the great need in South Australia is constructive methods as practised by Shillabceers and Butterfields. Certainly in those methods there is no place for the unfit sire. The improvement of stock is not only a matter of sentiment but of £ s. d., and our word "pecuniary" dates back to the times when so many head of cattle were the standard by which the bargains of barter were measured, and to-day in pastoral countries they maintain that position, and it is as true of them as of other standards of exchange that bad money drives out good. If the stock are not minted in the best mould they are bad coinage. No banking institution could carry on business if a doubt existed as to the value of its notes, and no stock-raising country can ever rise to eminence if its output is below par, and if its capital is on the down grade no amount of extra labor will save the situation.

A generation ago, natural selection and the survival of the fittest were the battle cries of those who deemed that Nature was always improving her handiwork, but there are so many examples where the inferior insect has beaten the superior mammal, including even man himself, that it would be most unwise to depend on safety through

these means. Mammalian life is the triumph of natural selection, but its improvement has come through a self-conscious evolution. The strongest stallion has dominated the herd till, past his prime, he is driven from his chieftainship by a younger and more worthy horse. The strongest bull has led his herd till failing vitality has forced him to resign in favor of a better. In these methods the birth rate has been more important than a decrease in the death rate. Mankind is unique in that his birth rate is the lowest among the animals, but his death rate is lower still, so that his increase in numbers is steadily in the ascendant. His civilisation, with its attendant care of the weak and the infirm, scarcely touches livestock, and where it does, humane sentiment is not entirely favorable to improvement.

Life is the product of the interaction of nature and nurture, of heredity and environment, of inborn tendencies and the surroundings in which they operate, and its origin, germ plasm, is continuous throughout the ages. Each newly conceived animal has cells within it that bring down the peculiarities of its ancestors, and will, in due course, carry on its own peculiarities. This great natural law has been seized upon by men with the breeder's instinct in the selection of their studs. No matter what mathematical rules may be laid down for value in points and so forth, that breeder's instinct will always remain a most important factor. It is a constructive factor in the elimination of the undesirable. It is the factor that assesses the value of stock mastership and the knowledge of stock of all ages. It appraises the suitability of locality and climate. It puts Friesians on the lucerne land of Fulham, but does not try to graze them on mallee roots. It is quick to value the peculiarities of stock, and grows big Suffolk sheep on Pinnaroo country that once raised only weakly Merinos. By general stock knowledge it shows whether ponies or shire horses will thrive best in a locality. It applies the hygiene of stock management, well knowing that the open paddock is the best place to start life in, and it is the determining factor that makes a man select his type and stick to it; it is the keynote of the success of the Murrays and the Collinses, this knowing what you want and the determination to carry on till you get it. It is the deathblow to the undesirable sire. It is the breeder's instinct declared in the best practice, and the breeder who is starting can have no better guide.

The man who puts a Berkshire on a Yorkshire and then tries a Tamworth, topping that with a Poland China, may possibly get a harlequin pig that would draw at a circus, but he will never be able to send sides of bacon to the factory so level that they scarcely vary half a pound. But the man who has visualised at the start the long, deep bacon side and matched and mated his boars and sows with a view to getting it and maintaining it is practising Mendelism, even though he has never heard of that reverend gentleman. There are certain broad principles in breeding that force themselves into notice. First, like produces like, and this is more true in the production of the undesirable than it is in improvement simply because it is far easier to slide down hill than to climb up. Mendel has put the proportions in mathematical form.

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Next comes pedigree versus chance. Length of pedigree is a splendid insurance, but the man who gambles on a chance is so pleased with his unexpected luck that he cackles about it all over the country till, by the very power of persistence, his one lucky foal has multiplied into a hundred. The value of pedigree lies in the performance of a sire's immediate ancestors. No matter how long the pedigree may be, if they are not up to the highest standard their progeny will fail too. The dam of winners is more often a more valuable animal than the winner, and this aspect of pedigree is too often lost sight of.

The idea of breeding is to mate two as perfect animals as possible, each excelling in its own sex. You cannot offset bad points by mating the best with the worst. The scrubber will stamp his influence and the result will be a few undoubtedly good points among a lot of bad ones; their utility will be entirely negated by their surroundings, in other words you will have a flashy weed. It is unfortunately necessary to stress this point of view in South Australia because there are a large number of men on the land who have implicit faith in the Government to provide them with good stallions, good bulls, good boars, and so, in the course of a few years, produce the very finest of stock. Mercury would not shift the wagon till the carter put his shoulder to the wheel, and no greater mistake can be made in stock-raising than that of expecting one sire to materially alter the character of a line of stock; it is the foundation on which he is to work that will give him his chance to make good. The Principal of Roseworthy College has pointed the way in the *Agricultural Journal* of August, 1921; he has, too, shown how impossible it is to move the wagon till the owner realises his responsibility. Great as is the influence of a sire, good or bad, he cannot suddenly alter scrubbers into thoroughbreds or *vice versa*, but the bad sire will do far more harm than the good one good. No matter how excellent a sire may be, he will not "nick" with every mate, and the mating and correction of faults, as well as the fixity of type that is wanted, are matters that can only be worked out by individuals; the selection of the young sire, his feeding on a high nutritive ratio, and his suitability for his work are all points quite as important as certified soundness, and that is a *sine qua non*. The weighbridge and the record book will soon tell against the scrub sire and furnish evidence of the improvement that mind and matter, when both are keen and sound, will effect in a line of stock and show how once the type aspired to is realised it may be fixed and bettered.

To sum up the steps required in the elimination of the scrub sire, the following rules will help:—

1. Select the breeds and classes of animals most suited to the soil and climate.
2. Farm the land so that it produces the best feed.
3. Keep the stock sound and healthy all the year round.
4. At the beginning lay down a definite type and mercilessly cull any marked deviation from it.
5. Study pedigree and never breed from a chance animal however attractive it may be.
6. Never breed from an unsound or degenerate weed.

7. Insist on size, energy, massive development, and virility in the male, fine quality and motherliness in the female.

8. Pay equal attention to selection of both dam and sire.

9. Watch prepotency on both sides; stick to those that breed true.

10. Start breeding with young vigorous animals, male and female.

11. Pension off old worn-out animals.

12. Keep clear of females that are old before being brought into the stud.

13. Mate so as to correct weak points of one by strong points of the other.

14. Avoid mating animals of widely different types.

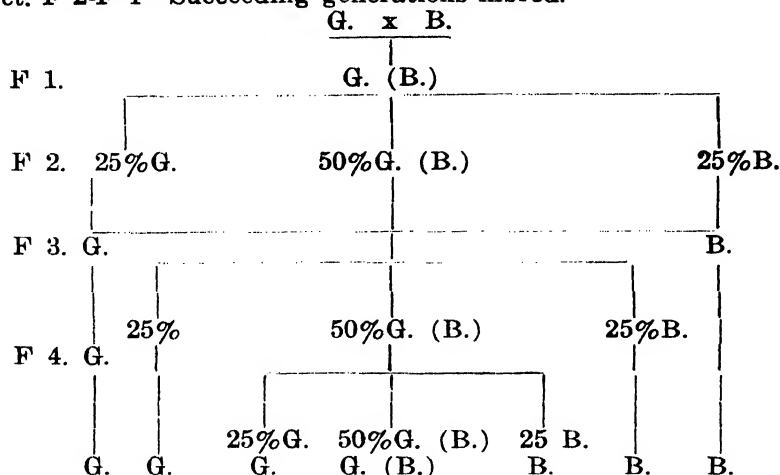
15. Study type. Breed to type. Stick to type.

#### MENDEL'S CHART.

Let. P—Parents, good and bad, G.B.

Let. F 1—First generation, G. (B.)—Impure dominant.

Let. F 2-F 4—Succeeding generations inbred.



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## THE CODLIN MOTH.

(*Carpocapsa pomonella*, LINN.)

[Compiled by GEORGE QUINN, Horticultural Instructor.]

The flesh-colored caterpillar with a dark-brown head frequently found in our apples and pears is the larva of this moth. It comes from a flat, milky-looking egg, about the size of a pin's head, which is deposited upon the fruits and adjacent leaves by the moth.

During the winter, when the fruit trees are bare, the caterpillar generally lies hidden away in a silky cocoon spun beneath the rough dead bark of the trees, or in knotholes or wounds in the wood. It also hides in posts, stakes, fences, fruit cases, crevices in fruit houses, or any other shelter that was at hand when it left the fruit towards the end of the previous summer. When the spring arrives the caterpillar gradually changes into a small, reddish-brown chrysalis. The moth develops inside of this chrysalis shell immediately.

When the blossom falls and the young pears and apples are noticeable, the first of these moths burst their chrysalis cases and force a way out through the closely-spun cocoon into the open air.

After pairing, the females deposit eggs upon fruits and leaves of the apple, pear, and quince trees, but seldom on those of stone fruits. In a few days from each fertile egg a small white hair-like black-headed caterpillar emerges. It crawls upon the fruits, and soon settles down to gnaw a passage into the pulp. The first evidence of its presence is shown in the reddish-brown sawdust-like burrowings protruding from the entrance of the tunnel. The infested fruits either fall or assume a ripened appearance prematurely. In about three weeks the caterpillar is full grown, and then it gnaws a passage out and quits the fruit, whether such fruit be on the tree or ground or packed in boxes. Sometimes, by means of a silken thread, it lowers itself from the fruit to a branch below or to the ground. It then crawls for refuge either to the tree stem, or any other available shelter, to spin a cocoon, change to a chrysalis, and emerge as a moth. The eggs deposited by this second generation of moths give rise to the second and most destructively numerous brood of caterpillars we find in the almost full-grown fruits. Knowing this much of its life history, we are better equipped to combat it. Catching the moths by means of lights and baits has proved of no value thus far. The egg, caterpillar, and chrysalis stages, however, offer better opportunities. The following remedies are based upon the life history as outlined above, and every person possessing infested trees in South Australia who fails to apply them when instructed by an Inspector so to do is liable to have the trees cut down or treated at his expense by the Inspector.

### REMEDIES.

#### CLEANING THE STEMS OF TREES.

Between July and October in every year scrape off all dead bark from the trunks and limbs, clean out all knotholes and crevices, and saw off any broken ends of limbs from all pear, apple, and quince



trees, and any other kind growing close to them. This work of scraping should be done thoroughly, and should extend from 2in. to 3in. below the soil line up to the highest point where the bark is rough. Catch and burn the scrapings wherever practicable. This scraping is done to destroy the caterpillars and chrysalides before any escape as moths, and to remove the natural shelter of the caterpillars.

#### TAKING AWAY ALL OTHER REFUGE.

Keep all vegetable growth, stakes, stones, rubbish, posts, &c., away from the trees *between November and June* in each year.

#### FRUIT HOUSES AND CASES.

Before October in each year all old fruit cases on the premises should be submerged in boiling water for at least five minutes. The fruit stores should be closed, so that the moths hatching therein may not escape. Cheese cloth nailed over all apertures will affect this purpose; kill the moths from time to time.

#### SPRAYING THE TREES TO POISON THE YOUNG CATERPILLARS.

As soon as the blossoms fall from the apple and pear trees, the newly-formed fruits should be coated with arsenate of lead spray wash, and three sprayings should be applied within a period of not more than four to six weeks. One or two other sprayings, at intervals of about one month, are necessary to protect late ripening apples and pears.

#### ARSENATE OF LEAD.

Mix not less than 1lb. of arsenate of lead paste or  $\frac{1}{2}$ lb. of the powdered form in 20galls. to 25galls. of water. No lime is needed.

*CAUTION.*—Care should be taken in keeping, handling, or applying the arsenate of lead, as it is poisonous if swallowed.

#### BANDAGING THE STEMS OF TREES.

In each year between the beginning of October and the middle of November place a bandage around the stems of all apple, pear, and quince trees, and any other kinds standing near by. A piece of common sacking 8in. wide folded double makes a suitable band. It should encircle the stem completely, and be drawn tightly and secured by a cord or pin.

The caterpillars collect beneath and inside such bandages, providing all the other shelters enumerated above have been withdrawn. The bands should be removed weekly throughout the fruit season, and all caterpillars crushed. If left undisturbed for two or three weeks during midsummer, some will have undergone the necessary transformations and emerge as moths. Remove and cleanse or burn the bandages finally after midwinter.

#### COLLECTING INFESTED AND FALLEN FRUIT.

If the trees are small, the infested fruits should be picked off weekly, or as often as possible. All fallen fruits should be collected at similar intervals, and receive immediate treatment, to kill the insects if they

are still inside. Boiling, or submerging in cold water for 48 hours, or cutting or crushing them up, are common methods of effecting this end. Unless first treated thus, throwing them to the pigs or other animals afford opportunities for the insects to escape.

*SPECIAL NOTE.*—*Apart from the fact that the owner of apple, pear, and quince trees may be required by law to take the above precautions, it will be to his own interest to do so in a thoroughly intelligent manner. By so doing, more particularly in thoroughly applying the spraying with the arsenate of lead, he will save the greater part of the fruit now lost or reduced in value through codlin moth injury.*

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## EXPERIMENTAL FARM HARVEST REPORTS.

### TURRETFIELD EXPERIMENTAL FARM.

[By W. J. SPAFFORD, Superintendent of Experimental Work, and  
F. E. WADDY, Manager.]

This farm, containing 1,605 acres, is situated in the hundreds of Nuriootpa and Barossa, about 30 miles north of Adelaide. The North Para River passes through the property, and is joined in its course through the same by Salt Creek. The most of the land is rather steeply undulating, but with the exception of about 150 acres, which is rough and stony, can all be put under cultivation.

#### THE SEASON, 1920.

The rainfall proved very favorable in most respects to the growth of cereal crops, for both the total and "useful" rain were comparatively heavy, and the distribution was very fair. The 1.97in. recorded in April-May made rather a low total of "seeding" rains, but from then onwards the rains were both plentiful and regular, with the result that good crops were secured. The monthly distribution of rain recorded at this farm since 1908 is set out below:—

#### *Rainfall Distribution at Turretfield, 1908-1920.*

	Means, 1908- 1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.	1920.	Means, 1908- 1920.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
January ....	0.57	—	0.21	0.46	0.82	0.55	0.25	0.12	0.19	0.42
February ....	0.60	3.12	1.12	0.01	0.08	1.39	0.41	1.40	—	0.81
March .....	1.38	2.32	0.62	0.19	0.56	1.22	0.44	—	0.73	1.00
April .....	0.89	0.25	2.06	1.33	1.03	0.74	0.72	0.12	0.47	0.86
May .....	2.91	0.54	1.30	3.61	1.08	4.08	2.14	1.73	1.50	2.35
June .....	2.20	0.12	0.38	3.76	5.51	1.92	1.93	1.23	3.97	2.29
July .....	2.74	1.53	1.49	1.57	2.00	2.57	1.55	0.48	1.75	2.05
August .....	2.44	1.71	0.31	1.91	3.43	2.21	1.73	1.77	2.90	2.17
September ..	2.60	2.81	0.43	4.90	1.55	3.83	0.58	1.86	1.89	2.37
October .....	1.93	2.39	0.09	1.00	2.08	1.86	1.39	0.78	2.21	1.65
November ...	0.98	1.10	1.41	0.17	3.35	1.24	0.64	0.08	1.50	1.11
December....	0.79	0.88	0.55	0.23	1.22	1.21	0.04	1.37	1.57	0.85
Total.....	20.03	16.77	9.97	19.14	22.71	22.82	11.82	10.94	18.68	17.93
"Useful" rain (April-Novem.)	16.69	10.45	7.47	18.25	20.03	18.45	10.68	8.05	16.19	14.85

Although the rainfall for the year was 18.68in., as is disclosed in the above table, there was recorded during the cropping season—April to November—the high total of 16.19in., and the distribution of this was quite favorable to the cereals, as can be seen displayed in the next table.

*Distribution of "Useful" Rain in 1920.*

	1920.	Means 1908-1920.
	In.	In.
Seeding rains (April-May) . . . . .	1.97	3.21
Winter rains (June-July) . . . . .	5.72	4.34
Spring rains (August-October) . . . . .	7.00	6.19
Early summer rains (November) . . . . .	1.50	1.11
	<hr/> 16.19	<hr/> 14.85

## CROPS.

Again this season but little cropping other than with cereals was practised.

*Flax for Seed.*—A block of land in Field No. 11 was divided into three plots, which were seeded with linseed at the rate of 40lbs., 50lbs., and 60lbs. of seed per acre respectively. These crops made quite fair growth, but at heading time a plague of caterpillars occurred, and these devoured most of the developing seeds. Last season similar rate-of-seeding tests were conducted with this crop, and the returns secured for the two seasons were:—

*Flax for Seed, Turretfield, 1919-1920.*

Plot.	Seed per Acre.	1919.		1920.		Means. 1919-1920.	
		B.	L.	B.	L.	B.	L.
1	40lbs. . . . .	5	15	1	19	3	17
2	50lbs. . . . .	6	15	1	5	3	38
3	60lbs. . . . .	3	32	1	13	2	22
		<hr/> 4	<hr/> 38	<hr/> 1	<hr/> 15	<hr/> 2	<hr/> 54
Farm average . . . . .		4	38	1	15	2	54

*Peas.*—Beside the crop in the rotation plot, a block of four acres in Field No. 4 was sown with Early Dun field peas, and from this 7 tons of peas were raked up, stacked, and are being fed to pigs from the stack.

*Green Forage Crops.*—Fields Nos. 10 and 15 were seeded with a mixture made with two parts barley, one part oats, and one part wheat, at the rate of 2bush. per acre, and made remarkably good growth, and carried much big stock right into the summer. Field No. 9A was seeded with a mixture of rape and Crimson clover, and, although the clover did not make much growth, the rape grew well, and carried much livestock.

*Sorghum.*—About 10 acres in Field No. 14 were seeded with Early Amber cane, and produced a good crop, which was cut for cows, and a second growth, which carried a lot of grazing livestock.

*Ensilage Crops.*—A concrete overhead silo was erected during the year, and the 90 tons necessary to fill this were secured mainly from the barley crop in the Bull Field (7½ acres), the remainder being secured from part of the Sprinkler field, which had been seeded with a mixture of fodder plants.

**Hay Crops.**—The only two fields sown for hay were Nos. 4 and 11, neither of which was fallowed. Field No. 4 carried a wheat crop in 1919, and was cultivated (not ploughed) between April 27th and May 5th, 1920, the drill delivering 80lbs. oats and 1cwt. superphosphate per acre, working just behind the cultivator. Field No. 11 carried a grazing crop, composed of a mixture of rye grass, rape, Crimson clover, and mustard, which was grazed off by the end of October, when the land was cultivated and worked down. In this field a number of varieties of wheats were drilled in between May 26th and June 8th, with 1cwt. superphosphate per acre. The remainder of the hay cut consisted of the headlands of fields sown for grain.

The return secured from the various fields are set out below:—

*Yields of Hay—Turretfield, 1920.*

Hay.	Field Grown.	Area. Acres.	Total Yield.			Yield per Acre.		
			T.	C.	L.	T.	C.	L.
Wheat (varieties) . . . .	No. 11	27.17	81	0	0	2	19	70
Oats (Sunrise) . . . . .	No. 3	2.91	8	10	0	2	18	47
Oats (Calcutta) . . . . .	No. 3	6.42	18	0	0	2	16	8
Wheat (headlands) . . . .	No. 3	9.22	24	0	0	2	12	7
Wheat (headlands) . . . .	Exp.	1.60	4	0	0	2	10	0
Wheat (headlands) . . . .	No. 13	4.81	11	10	0	2	7	92
Oats (varieties) . . . . .	No. 4	30.05	46	0	0	1	10	69
Farm average . . . . .	—	82.18	193	0	0	2	6	109

The average yield of 2 tons 6cwts. 109lbs. per acre disclosed in the table above, is very satisfactory, particularly when it is remembered that 70 per cent. of the area cut was unfallowed land.

The addition of this year's hay crop to the mean average yield of the farm increases this figure to 2 tons 1cwt. 12lbs. per acre, from the previous average of 2 tons 0cwt. 30lbs., as is shown in the following table:—

*Hay Returns—Turretfield, 1913-1920.*

Year.	Total Rainfall.	"Useful" Rainfall	Area Acres.	Total Yield.			Yield per Acre.		
	In.	In.		T.	C.	L.	T.	C.	L.
1913 . . . . .	16.77	10.45	200.00	311	0	0	1	11	0
1914 . . . . .	9.97	7.47	217.00	175	0	0	0	16	14
1915 . . . . .	19.14	18.25	75.26	252	0	0	3	6	108
1916 . . . . .	22.71	20.03	134.06	276	0	0	2	1	20
1917 . . . . .	22.82	18.45	66.79	158	0	0	2	7	35
1918 . . . . .	11.82	10.68	106.64	243	15	0	2	5	77
1919 . . . . .	10.94	8.05	180.76	304	0	0	1	13	71
1920 . . . . .	18.68	16.19	82.18	193	0	0	2	6	109
Means . . . . .	16.61	13.70	—	—	—	—	2	1	12

**Oat Crops.**—Other than the small area of 3.04 acres of Scotch Grey in Field No. 3, all oat crops were grown on stubble land, and even then the lowness of the yield would not have occurred but for the fact that the best of the oat crops on stubble land were cut for hay, and

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Exceptionally drought-resisting. Comes in early and can be fed off from five to six weeks after seeding. Makes first-class Ensilage, Green Feed, and Hay. Two cuttings can be secured in one season.

#### IMPHEE, or Planter's Friend.

Very valuable Summer and Autumn Fodder. Withstands heat and drought, and is also suitable for late sowing, as it will withstand frosts better than other sorts.

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only the poorer parts allowed to mature grain. The yields secured from the various oat crops are arranged in the table below:—

*Yield of Oats—Turretfield, 1920.*

Variety.	Field Grown.	Area. Acres.	Total Yield.		Yield per Acre. Bush. lbs.
			Bush.	lbs.	
Scotch Grey . . . . .	No. 3	3.04	118	28	39 2
Sunrise . . . . .	No. 4	2.27	52	29	23 9
Oats (mixed) . . . . .	No. 4	26.38	450	35	17 3
Calcutta . . . . .	Exp.	2.39	51	15	21 20
Farm average . . . . .	—	34.08	673	27	19 31

The mean average yield for oats at this farm since 1915 is now 21bush. 39lbs. per acre, as is shown below:—

*Oat Returns—Turretfield, 1915-1920.*

Year.	Total Rainfall In.	“Useful” Rainfall In.	Area. Acres.	Total Yield.		Yield per Acre. Bush. lbs.
				Bush.	lbs.	
1915 . . . . .	19.14	18.25	21.49	576	3	26 23
1916 . . . . .	22.71	20.03	22.32	458	32	20 22
1917 . . . . .	22.82	18.45	33.50	1,015	20	30 13
1918 . . . . .	11.82	10.68	18.93	510	0	26 38
1919 . . . . .	10.94	8.05	22.88	176	30	7 29
1920 . . . . .	18.68	16.19	34.08	673	27	19 31
Means . . . . .	17.68	15.27	—	—	—	21 39

*Barley Crops.*—Only six-rowed barleys were sown this season, and all seed was drilled into stubble land, which had been broken up in the winter, and the returns secured, although not extremely high, are quite satisfactory, and are to be seen in the next table:—

*Yields of Barleys—Turretfield, 1920.*

Variety.	Field Grown.	Area. Acres.	Total Yield.		Yield per Acre. Bush. lbs.
			Bush.	lbs.	
Shorthed . . . . .	No. 9	17.50	444	0	25 19
Shorthed . . . . .	No. 4	21.35	510	20	23 45
Roseworthy Oregon . . . . .	No. 4	9.23	216	0	23 20
Shorthed . . . . .	Exp.	2.48	45	36	18 22
Farm average . . . . .	—	50.56	1,216	6	24 3

The inclusion of this season's barley yield in the mean average yield for the period 1916 to 1920 makes this figure 25bush. 32lbs. per acre, which is a reduction of a few pounds on the previous average of 26bush. 1lb. per acre. The various crops of barley grown at this farm are set out in the next table.

*Barley Returns—Turretfield, 1916-1920.*

Year.	Total "Useful"		Area. Acres.	Total Yield. Bush. lbs.		Yield per Acre.	
	Rainfall. In.	Rainfall. In.				Bush. lbs.	Bush. lbs.
1916 . . . . .	22.71	20.03	24.73	767	3	31	1
1917 . . . . .	22.82	18.45	9.13	351	22	38	25
1918 . . . . .	11.82	10.68	20.86	425	15	20	19
1919 . . . . .	10.94	8.05	53.27	756	31	14	10
1920 . . . . .	18.68	16.19	50.56	1,216	6	24	3
Means . . . . .	17.39	14.68	—	—	—	25	32

*Wheat Crops.*—All wheat crops were grown on fallowed land, and where the weeds were well under control quite satisfactory returns were secured. The crops in Field No. 11 made very heavy rank growth, and many of them lodged rather badly; but, despite this fact, high grain yields were secured. In Field No. 13 and also in experimental plots, Cape weed, which germinated after the wheat was sown, caused much trouble, and had a marked injurious effect on yields of grain. The erratic and irregular yields secured from the varieties grown in Field No. 3 are largely accounted for by the fact that there are many patches of shallow soil overlying rock in this paddock, and on these places the crops were really poor. The yields of the various varieties grown on the farm are set out in the next table:—

*Yields of Wheats—Turretfield, 1920.*

Variety.	Field Grown. No.	Area. Acres.	Total Yield. Bush. lbs.		Yield per Acre. Bush. lbs.	
Caliph . . . . .	11	14.32	444	51	31	4
Gluyas . . . . .	13	14.94	423	48	28	22
Echo . . . . .	11	2.46	69	22	28	12
King's White . . . . .	11	22.29	628	4	28	11
White Essex . . . . .	11	26.26	718	37	27	22
Basil . . . . .	11	4.40	117	20	26	40
Late Gluyas . . . . .	11	13.42	353	44	26	21
Marshall's No. 3 . . . . .	3	7.94	186	55	23	32
Gaston . . . . .	11	7.43	172	13	23	11
Major . . . . .	13	13.97	323	19	23	9
Federation . . . . .	13	27.59	632	3	22	55
Huguenot . . . . .	3	13.77	314	17	22	49
Crossbred 53 . . . . .	3	22.95	514	6	22	24
Silver Baart . . . . .	13	9.94	218	51	22	1
Early Crossbred 53 . . . . .	3	11.96	201	49	16	52
Yandilla King . . . . .	3	18.12	298	34	16	29
Selection Plots. . . . .	Exp.	3.16	83	9	26	19
Queen Fan . . . . .	Exp.	1.21	30	45	25	25
Leak's Rust Proof . . . . .	Exp.	22.14	391	46	17	41
Queen Fan . . . . .	Exp.	34.00	333	20	9	48
Farm average . . . . .	—	292.27	6,456	53	22	6

The average return of 22bush. 6lbs. per acre is highly satisfactory, and is the highest yield received in any year at this farm during the period 1912 to 1920. The next table gives details of all wheat crops grown here for the past nine years.



*Wheat Returns—Turretfield, 1912-1920.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.		Yield per Acre.	
	In.	In.		Bush.	lbs.	Bush.	lbs.
1912 .....	17.00	15.81	280.17	5,687	27	20	18
1913 .....	16.77	10.45	185.83	3,159	17	17	0
1914 .....	9.97	7.47	142.75	811	30	5	41
1915 .....	19.14	18.25	277.06	4,451	35	16	4
1916 .....	22.71	20.03	234.74	3,660	49	15	36
1917 .....	22.82	18.45	212.88	3,050	11	14	20
1918 .....	11.82	10.68	139.54	2,984	42	21	23
1919 .....	10.94	8.05	257.99	4,552	15	17	39
1920 .....	18.68	16.19	292.27	6,456	53	22	6
Means . . . .	16.65	13.93	—	—	—	16	41

Most of the varieties of wheats grown this season have been seeded for each of the past four years, so their behaviour during that period is set out in the following table, to which has been added the mean average yield of six varieties which have been continuously grown at the farm since 1913:—

*Yields of Varieties of Wheats—Turretfield, 1913-1920.*

Variety.	B. L.		B. L.		B. L.		B. L.		Means.		Means.	
	1917.	1918.	1918.	1919.	1920.	1920.	1913-20.	1917-20.	1913-20.	1917-20.	1913-20.	1917-20.
Gluyas .....	7 8	28 9	23 50	28 22	19 38	21 52	19 38	21 52	19 38	21 52	19 38	21 52
King's White .....	9 51	24 57	24 22	28 11	17 55	21 50	17 55	21 50	17 55	21 50	17 55	21 50
Huguenot .....	21 27	10 13	16 27	22 49	17 6	17 44	17 6	17 44	17 6	17 44	17 6	17 44
Marshall's No. 3 .....	15 36	19 48	20 0	23 32	16 52	19 44	16 52	19 44	16 52	19 44	16 52	19 44
Crossbred 53 .....	22 40	20 28	13 21	22 24	16 46	19 43	16 46	19 43	16 46	19 43	16 46	19 43
Yandilla King .....	8 22	18 56	14 50	16 29	14 5	14 39	14 5	14 39	14 5	14 39	14 5	14 39
Caliph .....	23 30	17 29	21 20	31 4	—	23 20	—	23 20	—	23 20	—	23 20
Silver Baart .....	28 42	20 54	21 7	22 1	—	23 11	—	23 11	—	23 11	—	23 11
Leak's Rust Proof .....	26 10	24 20	16 28	17 41	—	21 17	—	21 17	—	21 17	—	21 17
White Essex .....	23 9	16 21	17 20	27 22	—	21 3	—	21 3	—	21 3	—	21 3
Federation .....	17 29	22 55	18 26	22 55	—	20 26	—	20 26	—	20 26	—	20 26
Late Gluyas .....	3 20	23 15	21 28	26 21	—	18 36	—	18 36	—	18 36	—	18 36
Gaston .....	12 19	23 15	15 20	23 11	—	18 31	—	18 31	—	18 31	—	18 31
Echo .....	16 19	17 34	10 57	28 12	—	18 16	—	18 16	—	18 16	—	18 16
Queen Fan .....	24 12	21 3	15 39	10 20	—	17 55	—	17 55	—	17 55	—	17 55
Basil .....	—	22 27	16 45	26 40	—	—	—	—	—	—	—	—
Major .....	—	18 3	17 32	23 9	—	—	—	—	—	—	—	—
Early Crossbred 53 ..	—	—	15 55	16 52	—	—	—	—	—	—	—	—
Farm Average ..	14 20	21 23	17 39	22 6	16 13	18 52	16 13	18 52	16 13	18 52	16 13	18 52
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Total rainfall .....	22.82	11.82	10.94	18.68	16.61	16.06	16.61	16.06	16.61	16.06	16.61	16.06
"Useful" rainfall ..	18.45	10.68	8.05	16.19	13.70	13.34	13.70	13.34	13.70	13.34	13.70	13.34

During this four-year period the best varieties have proved to be:—Caliph (23bush. 20lbs.), a Roseworthy Agricultural College crossbred wheat, which is doing really well as a grain producer in most parts of South Australia; Silver Baart (23bush. 11lbs.), a South African wheat introduced many years ago, which has done fairly well in some of our mallee districts; Gluyas (21bush. 52lbs.), and King's White (21bush. 50lbs.), the two well-known very early, hardy wheats; Leak's Rust

Proof (21bush 17lbs.), one of the best hay wheats grown in this State, being a tall-growing, hardy, midseason variety; and White Essex (21bush. 3lbs.), which is often incorrectly known as White Tuscan, and which is an extremely good hay variety in good condition.

#### EXPERIMENTAL PLOTS.

A fairly extensive system of experimental plots, to be continued for a long time on the same land, have been mapped out at Turretfield, and include work with manuring, cultivation, depth of ploughing, and various rotation of crops.

#### PERMANENT MANURIAL PLOTS.

The manurial plots, being worked on the bare fallow—wheat rotation, and commenced in 1915, have now carried their fifth wheat crop, and for the period 1916-1920 have yielded as is shown below:—

#### *Permanent Manurial Plots—Turretfield, 1916-1920.*

Plot.	Manuring per Acre.	Yield per Acre.					Means. 1916-20.
		1916.	1917.	1918.	1919.	1920.	
		B. L.	B. L.	B. L.	B. L.	B. L.	B. L.
1.	$\frac{1}{2}$ cwt. superphosphate . . . .	21 41	10 55	21 29	15 17	8 20	15 32
2.	1cwt. superphosphate . . . .	19 7	9 43	21 32	15 3	10 31	15 11
3.	2cwts. superphosphate . . . .	22 1	10 13	22 45	16 29	8 46	16 3
4.	3cwts. superphosphate . . . .	19 10	9 47	21 34	17 9	10 6	15 33
5.	No manure . . . . .	18 52	8 33	19 46	10 39	7 8	13 0
6.	1cwt. super., $\frac{1}{2}$ cwt. nitrate of soda (spring) . . . . .	20 16	9 25	22 53	15 1	14 22	16 23
7.	2cwts. super., $\frac{1}{2}$ cwt. nitrate of soda (spring) . . . . .	22 4	9 50	23 51	15 23	14 19	17 5
8.	1cwt. super., $\frac{1}{2}$ cwt. sulphate of ammonia (seeding) . . . .	22 59	10 20	22 2	18 48	12 26	17 19
9.	2cwts. super., $\frac{1}{2}$ cwt. sulphate of ammonia (seeding) . . . .	21 56	9 37	24 41	15 28	14 29	17 14
10.	1cwt. super., $\frac{1}{2}$ cwt. sulphate of potash (seeding) . . . . .	21 43	11 36	24 8	14 59	12 32	17 0
11.	2cwts. super., $\frac{1}{2}$ cwt. sulphate of potash (seeding) . . . . .	25 36	9 33	26 9	15 29	13 56	18 9
12.	2cwts. super., $\frac{1}{2}$ cwt. sulph. potash (seeding), $\frac{1}{2}$ cwt. ni- trate soda (spring) . . . . .	23 10	10 25	25 38	16 3	14 18	17 55
13.	1cwt. superphosphate . . . .	23 7	9 44	27 44	15 22	11 16	17 27
14.	No manure . . . . .	18 36	9 47	25 50	11 27	7 46	14 41
15.	1cwt. basic slag . . . . .	20 10	7 59	26 54	17 27	10 29	16 36
16.	2cwts. basic slag . . . . .	18 58	8 57	23 36	16 37	12 51	16 12
17.	10 tons farmyard manure . .	22 58	7 30	25 20	12 21	6 53	15 0
18.	10 tons farmyard manure, 2cwts. super. . . . .	20 27	7 57	22 34	15 36	6 59	14 43
19.	10 tons farmyard manure, 2cwts. super., $\frac{1}{2}$ cwt. sul- phat of potash . . . . .	22 12	9 49	23 21	17 1	7 58	16 4
20.	2cwts. super., 4cwts. gypsum .	20 48	10 37	25 50	20 8	13 23	18 9
21.	2cwts. super., 5cwts. lime . .	20 11	11 13	26 10	19 27	12 13	17 51
22.	2cwts. super. (half at ploughing) . . . . .	19 33	6 9	24 30	16 23	13 31	16 1
23.	2cwts. super. (half at ploughing), $\frac{1}{2}$ cwt. nitrate of soda . . . . .	23 26	5 26	26 48	17 37	10 16	16 43

## PERMANENT CULTIVATION PLOTS.

A series of experimental plots worked on the bare fallow—wheat rotation, and having as their object the testing of different methods of cultivating bare fallow for the growing of wheat, were commenced in 1915, and have now carried five wheat crops, the returns from which are to be seen in the next table.

*Permanent Cultivation Plots—Turretfield, 1916-1920.*

(All plots are dressed with 2cwts. superphosphate per acre.)

Plot.	Treatment.	Yield per Acre.					Means.
		1916. B. L.	1917. B. L.	1918.. B. L.	1919. B. L.	1920. B. L.	1916-20. B. L.
<i>Early Fallow (June-July).</i>							
24.	Ploughed 6in. deep and harrowed within a few days. Cultivated or harrowed whenever weeds or a crust render necessary . . . . .	19 31	6 39	24 50	18 16	7 41	15 23
25.	Ploughed 6in. deep and left rough throughout the winter. Cultivated or harrowed whenever weeds or a crust render necessary ..	22 6	6 34	25 16	15 31	9 48	15 51
26.	Ploughed 6in. deep, rolled within a few days, and cultivated or harrowed according to circumstances. Cultivated or harrowed whenever weeds or a crust render necessary . . . . .	25 14	7 57	26 46	20 47	10 21	18 13
27.	Ploughed 6in. deep, and skim ploughed after first rain. Cultivated or harrowed whenever weeds or a crust render necessary . . . . .	15 17	7 17	24 19	17 44	5 6	15 57
<i>Late Fallow (September).</i>							
28.	Ploughed 3in. deep, and cultivated according to requirements, but not rolled	10 57	8 7	22 37	10 3	5 3	11 21
29.	Ploughed 6in. deep and heavily rolled the same day as ploughed. Cultivated according to requirements . . . . .	9 40	7 12	22 21	10 45	5 1	11 0
<i>Autumn Ploughing (March-April).</i>							
30.	Not bare fallowed, but ploughed 4in. deep and immediately rolled. Cultivated according to requirements . . . . .	8 34	Failure.	16 54	5 9	6 12	7 22

## PERMANENT DEPTH OF PLOUGHING PLOTS.

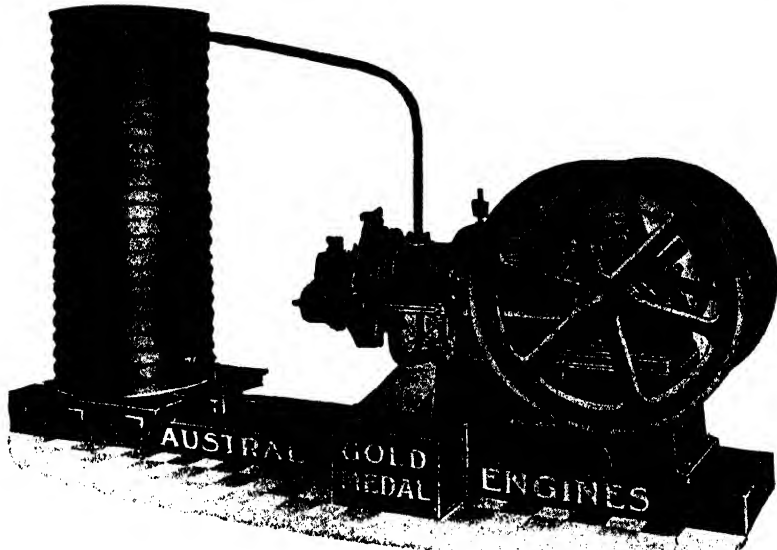
Another set of cultivation plots on the bare fallow—wheat system of rotation, using 2cwts. superphosphate per acre, and having as their object the testing of various depths of ploughing, were commenced at

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the same time as the plots shown above. The returns secured for the five seasons are set out below:—

*Permanent Depth of Ploughing Plots—Turretfield, 1916-1920.*

Plot.	Depth of Ploughing.	Yield per Acre.					Means.
		1916.	1917.	1918.	1919.	1920.	1916-20.
		B. L.	B. L.	B. L.	B. L.	B. L.	B. L.
31.	Ploughed 3in. deep . . . .	12 37	6 24	21 38	17 43	7 24	13 9
32.	Ploughed 6in. deep . . . .	14 33	6 19	21 47	17 33	6 0	13 14
33.	Ploughed 9 in. deep . . . .	15 35	6 14	21 59	14 22	7 53	13 13
34.	Ploughed 9in. deep (to be then twice ploughed 3in. before again being ploughed 9in.) . . . .	15 45*	—	24 11†	—	8 3†	14 52
		—	7 7*	—	19 14†	—	

\* 9in. ploughing. † 3in. ploughing.

ROTATION OF CROPS—EXPERIMENTAL PLOTS.

The various series of rotation of crop plots commenced in 1915, carried their fifth crop this year, but the results obtained are hardly sufficient yet to properly interpret them, and at present are still little more than yields of cereals with different dressings of superphosphate. The results as they stand are arranged in tabular form below:—

*Rotation Plots—Turretfield, 1916-1920.*

	1916.	1917.	1918.	1919.	1920.	Means
	B. L.	B. L.	B. L.	B. L.	B. L.	1916-1920.
						B. L.
SERIES I.—PLOTS 1 AND 2.						
<i>Bare Fallow—Wheat (2cwt. Super.).</i>						
Wheat . . . .	7 57	12 5	11 58	10 16	13 54	11 14
SERIES IIA.—PLOTS 3 TO 5.						
<i>Pasture—Bare Fallow—Wheat (no Manure).</i>						
Wheat . . . .	8 40	8 38	9 34	9 23	7 31	8 45
SERIES IIB.—PLOTS 6 TO 8.						
<i>Pasture—Bare Fallow—Wheat (½cwt. Super.).</i>						
Wheat . . . .	11 46	10 51	11 54	13 25	8 14	11 14
SERIES IIC.—PLOTS 9 TO 11.						
<i>Pasture—Bare Fallow—Wheat (1cwt. Super.).</i>						
Wheat . . . .	12 3	9 19	12 43	10 0	8 10	10 27
SERIES IID.—PLOTS 12 TO 14.						
<i>Pasture—Bare Fallow—Wheat (2cwt. Super.).</i>						
Wheat . . . .	15 1	12 23	11 34	8 16	14 43	12 23
SERIES IIE.—PLOTS 15 TO 17.						
<i>Pasture—Bare Fallow—Wheat (3cwt. Super.).</i>						
Wheat . . . .	14 26	11 27	12 52	14 31	14 57	13 39

*Rotation Plots—Turretfield, 1916-1920—continued.*

	1916.	1917.	1918.	1919.	1920.	Means.
	B. L.	B. L.	B. L.	B. L.	B. L.	1916-1920.
<b>SERIES IIIA.—PLOTS 18 TO 20.</b>						
<i>Bare Fallow—Wheat (2cwt. Super.)—Barley (1cwt. Super.)</i>						
Wheat .. .. .	15 43	6 36	15 37	13 7	19 19	14 4
Barley .. .. .	12 45	19 9	20 3	20 17	18 34	18 12
<b>SERIES IIIB.—PLOTS 21 TO 23.</b>						
<i>Bare Fallow—Wheat (2cwt. Super.)—Oats (1cwt. Super.)</i>						
Wheat .. .. .	12 26	8 18	18 42	9 59	14 44	12 50
Oats .. .. .	28 30	15 20	16 2	12 2	13 24	17 8
<b>SERIES IIIC.—PLOTS 24 TO 26.</b>						
<i>Bare Fallow—Wheat (2cwt. Super.)—Pease (1cwt. Super.)</i>						
Wheat .. .. .	13 21	6 22	14 22	14 47	21 55	14 9
<b>SERIES IIID.—PLOTS 27 TO 29.</b>						
<i>Bare Fallow—Wheat (2cwt. Super.)—Rape (1cwt. Super.)</i>						
Wheat .. .. .	11 14	6 22	17 39	12 18	16 48	12 52
<b>SERIES IV.—PLOTS 30 TO 34.</b>						
<i>Bare Fallow—Wheat and Lucerne (2cwt. Super.)—Lucerne—Lucerne—Lucerne.</i>						
Wheat .. .. .	12 40	10 0	18 51	21 41	25 25	17 43
<b>SERIES V.—PLOTS 35 AND 36.</b>						
<i>Sorghum—Wheat (2cwt. Super.).</i>						
Wheat .. .. .	17 8	4 9	13 55	17 6	21 4	14 40
<b>SERIES VI.—PLOTS 37 AND 38.</b>						
<i>Bare Fallow—Wheat (2cwt. Super.).</i>						
Wheat .. .. .	14 0	6 36	19 6	16 28	24 15	16 5
<b>SERIES VIIA.—PLOTS 39 TO 41.</b>						
<i>Bare Fallow—Wheat (2cwt. Super.)—Rye (1cwt. Super.). For Grazing.</i>						
Wheat .. .. .	13 8	8 8	18 46	19 48	22 27	16 27
<b>SERIES VIIB.—PLOTS 42 TO 44.</b>						
<i>Bare Fallow—Wheat (2cwt. Super.)—Oats (1cwt. Super.). For Grazing.</i>						
Wheat .. .. .	12 17	6 36	19 57	18 13	19 49	15 22
<b>SERIES VIIC.—PLOTS 45 TO 47.</b>						
<i>Bare Fallow—Wheat (2cwt. Super.)—Barley (1cwt. Super.). For Grazing.</i>						
Wheat .. .. .	14 6	10 11	19 49	17 14	20 29	16 22
<b>SERIES VIIIA.—PLOTS 48 TO 51.</b>						
<i>Bare Fallow—Wheat (2cwt. Super.)—Barley (1cwt. Super.)—Pasture.</i>						
Wheat .. .. .	16 46	7 57	21 34	18 52	22 10	17 28
Barley .. .. .	6 4	25 19	21 39	7 29	18 11	15 40
<b>SERIES VIIIB.—PLOTS 52 TO 55.</b>						
<i>Bare Fallow—Wheat (2cwt. Super.)—Oats (1cwt. Super.)—Pasture.</i>						
Wheat .. .. .	20 8	4 44	20 43	24 29	25 29	19 7
Oats .. .. .	7 7	11 33	23 23	14 39	29 13	17 15
<b>SERIES IX.—PLOTS 56 TO 59.</b>						
<i>Bare Fallow—Wheat, with Rye Grass (2cwt. Super.)—Rye Grass—Rye Grass.</i>						
Wheat .. .. .	11 28	6 58	21 9	14 51	25 27	15 59

*Grazing of Rotation Plots.*

	Sheep per Acre per Year.					Means. 1916-20.
	1916.	1917.	1918.	1919.	1920.	
<b>SERIES IIIc. (Plots 24 to 26)—</b>						
Peas with lwt. superphosphate . . . .	2.47	3.75	1.49	1.28	2.53	2.30
<b>SERIES IIId. (Plots 27 to 29)—</b>						
Rape with lwt. superphosphate . . . .	3.11	2.54	1.73	0.45	1.72	1.91
<b>SERIES IV. (Plots 30 to 34)—</b>						
Lucerne sown with wheat and 2cwts. superphosphate; the lucerne grazed for three years—						
Plot 31 . . . . .	—	2.32	1.29	0.55	†	—
Plot 30 . . . . .	—	—	1.48	0.55	†	—
<b>SERIES V. (Plots 35 and 36)—</b>						
Sorghum with lwt. superphosphate . .	1.45	Failure	Failure	Failure	4.60	1.21
<b>SERIES VIIA. (Plots 39 to 41)—</b>						
Rye with lwt. superphosphate . . . .	3.71	2.29	1.12	1.37	2.70	2.24
<b>SERIES VIIb. (Plots 42 to 44)—</b>						
Oats with lwt. superphosphate . . . .	3.05	3.49	1.31	0.74	2.90	2.30
<b>SERIES VIIC. (Plots 45 to 47)—</b>						
Barley with lwt. superphosphate . . .	3.12	3.20	1.33	1.06	2.80	2.30
<b>SERIES IX. (Plots 56 to 59)—</b>						
Rye grass sown with wheat and 2cwts. superphosphate; the rye grass grazed for two years—						
Plot 56 . . . . .	—	1.74	1.51	†	†	—

**IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC.**

During the month of September, 1921, 15,082bush. of bananas, 141bush. of passion fruit, 6 packages of peanuts, 809bush. of pine-apples, 17,633 bags of potatoes, 25 packages of plants, 19 packages of trees, 8 packages of bulbs, 30 packages of seeds, and 2,368 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910. Of these, 40bush. of bananas (over-ripe), 1 package of bulbs, and 1 package of plants (no Phylloxera declaration) were destroyed, and 7 packages of trees and 20 empty wine casks were fumigated.

Under the Federal Commerce Act, 6,517 packages of dried fruit, 3,214 packages of preserved fruit, 7,209 packages of citrus fruit, and 200 packages of fresh fruit were exported to overseas markets. These were consigned as follows:—To London—2,347 packages of dried fruit and 2,739 packages of preserved fruit. To South Africa—1,603 packages of dried fruit. To India and East—200 packages of apples, 673 packages of citrus fruit, and 100 packages of dried fruit. To New Zealand—6,536 packages of citrus fruit, 2,467 packages of dried fruit, and 475 packages of preserved fruit.

Under the Federal Quarantine Act, 1,456 packages of seeds, &c., were examined and admitted from overseas sources.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

## THIRTY-SECOND ANNUAL CONGRESS.

**Tuesday Morning.***(Continued from page 221.)*SOME OBSERVATIONS ON VARIETIES OF OATS AND  
THEIR CULTIVATION IN SOUTH AUSTRALIA.

Proceedings were commenced on Tuesday morning by the reading of the following paper by the Principal of the Roseworthy Agricultural College, Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S.:—

Except in some of the cooler regions of the State, oats are rightly regarded as a subsidiary crop, and their interests are naturally subordinated to those of greater importance. Nevertheless it will be readily admitted that the oat stands pre-eminent amongst cereals as a source of home-grown, easily digestible food nutrients, and on this ground alone it is deserving of a permanent place in our farming systems to the utmost limit permitted by its powers of adaptation to conditions and by its economic value.

The actual production of oats throughout the world is greater by measure than that of any other cereal, but South Australia's contribution is insignificant. Out of a total of 4,000,000,000bush. harvested in 1911 our State was responsible for less than  $1\frac{1}{2}$  millions, and the average yield per acre for the last 10 years was but slightly above  $10\frac{1}{2}$ bush.

My purpose in choosing this subject, however, was not to advocate the rapid extension of oats as a grain crop, although I believe that when the values of cereals per pound of grain approximate to pre-war figures, steady expansion of this area will take place. The demand for meal and seed must grow in conformity with increased population and closer settlement. Closer settlement naturally implies the combination of animal husbandry and cropping, and the keeping of more stock per unit of area. But even without closer settlement, whenever the ordinary cropping programme is curtailed on economic or other grounds, it will be necessary to resort to sown pasturage in order to maintain the carrying capacity at its former level.

## TYPE OF PASTURAGE.

Now, admitting the soundness of this general proposition, what form of pasturage should we seek to establish? In my view the preference should, whenever possible, be given to oats. I have qualified this statement because I am not ignorant of the limitations of the oat crop, and I know from experience that under certain conditions oats would



fail in all but the most favorable of years. In dry, sandy districts, for instance, attempts to establish oats would, in many instances, be foredoomed to failure. There are, however, many portions of the State outside of the recognised humid areas where certain types of oats may be expected to thrive if given fair treatment.

It may reasonably be asked why oats should be chosen in place of barley for adding to the grazing area, and no doubt many will be prepared to argue that barley, which, in the young stage, is quite as palatable and equally as nutritious as oats, is even more resistant to dry weather in the autumn, and possesses greater vigor, which enables it to grow rapidly and make quicker recovery after grazing or cutting. That there is good reason to support these views will be freely admitted if the comparison be drawn between barley and Algerian oats; but if, on the other hand, some quick-growing type of oat be substituted for Algerian, the arguments would lose much of their force. Again, barley pasturage, whilst very prolific and serviceable in the autumn and winter, thins out in the spring, whereas oats steadily improve in the colder weather, and strengthen into a thick mass of forage, which lasts through the spring and early summer.

A further point in favor of oats is that barley, if allowed to stand, makes a light, fluffy, inferior type of hay, whereas oaten is the most valuable of all kinds of cereal hay if properly saved. The importance of this becomes apparent when it is realised that at the opening of the season farmers have no fixed idea as to the ultimate destiny of the sown pastures, but I assume that they would prefer to grow a crop that can confidently be shut up for silage or hay if not further needed for grazing. In any event it is never wise to rely solely on any one class of fodder, and even if barley be largely employed for early feed there is still ample room for an early type of oat that will adapt itself to and thrive under our conditions.

#### SELECTION OF VARIETIES.

Varieties adapted to such districts require to be speedy germinators and capable of developing quickly a root system that will sustain them through dry periods in the early autumn. They should be able to make steady progress during the winter months so that when spring arrives they will have reached the stage of ear formation, and be capable of completing development on a minimum amount of heat, so that the final activities of the plants may be completed before the onset of the desiccating winds and high temperatures that so frequently herald the approach of our Australian summer.

Up to the present the only varieties that have established claims for consideration under such conditions have been the Algerian, Calcutta, and Cape oats, and of these the Algerian is deservedly the most popular. The Cape oat is much the quickest grower, and in this respect it fulfils our requirements admirably, but unfortunately it possesses very weak straw that goes down badly in relatively calm years and, furthermore, the grain shatters readily and the whole plant is very subject to attacks of rust. It is mainly the lodging habit and the consequential difficulty in harvesting that has caused it to be neglected in favor of the slower growing Algerian type.

Calcutta oats do not differ markedly from Algerian in general appearance. The straw is a little taller and coarser, and the grain somewhat larger, but in the drier districts preference is given to Algerian oats on the ground that the latter are more drought resisting and hold their grain better.

In selecting an oat for the warmer areas, however, we must bear in mind that the crop has to be sown—usually in a dry seed bed—at the end of March or early in April, and that it is desirable to grow a variety that will furnish during May and June a wealth of green fodder for ewes and lambs.

This will not always be necessary of course, but it does not infrequently happen that lambs and ewes are pinched for green fodder—for which there is no wholly satisfactory substitute—at this time of the year when stubbles are exhausted and pastures backward. The advantage of possessing a field of green oats at such a time is sufficiently obvious to all practical farmers, and whilst in favorable years the Algerian variety will furnish a fair picking under average conditions, it fails to fill the gap. Compared with several newly introduced varieties, as well as some of the Algerian derivatives evolved by Mr. Pridham, Algerian oats make very slow progress indeed during the autumn and winter months. Upon germinating they develop a circle of fine prostrate leaves that appear to mark time during the cooler months, and the plants subsequently spring into activity in much the same way as the late wheats. On the other hand, varieties such as Bathurst Early, Early Burt, Sunrise, Kelsall's, Lachlan, and others behave after the manner of early wheats like Early Gluyas or Golden Drop. They germinate promptly after rain falls, and after a vigorous start, continue to develop foliage throughout the autumn and winter months. This confers upon them a decided advantage over Algerian oats, and if it can be shown that this habit of early and speedy growth is not associated with counterbalancing defects, these varieties will merit exhaustive trials in all districts where Algerian oats predominate.

Ever since the College was established continued efforts have been made to raise oats above the level of a chance crop, and for many years Algerian oats were kept under trial. Subsequently Calcutta oats were purchased annually from Mount Gambier, and then they gave place to the Scotch Dun or Grey variety. Finally we procured from New South Wales a collection of imported and crossbred types, several of which have given very promising results, and it is these that I desire to commend to you for trial in your respective districts. The introduced varieties comprise:—

(1) *Early Burt*, or May oats, which come to us from the United States of America with a reputation for immunity to smut. This oat is one of the quickest to start, and it ripens off earlier than Sunrise or Scotch Grey.

(2) *Kherson*, or Sixty Day oats.—A Russian variety noted for rigidity of straw and heavy yielding capacity.

(3) *Smyrna*.—Introduced through the Washington Bureau of Agriculture as an early type with fine quality straw.

(4) *Stark's Hooimaker*.—A tall growing oat, resembling Sunrise in habit, but stools better and is less liable to lodge.

(5) *Ruakura*.—A rust-resisting medium early type, selected from an Algerian oat crop by Mr. A. W. Green, of the Ruakura School of Agriculture in New Zealand. It is hardly early enough for the drier districts, but should suit the cooler and intermediate districts.

(6) *Scotch Grey*.—This is a variety that has been grown very successfully at Roseworthy College for some years. It is a rapid grower and a prolific stoler. Although it is comparatively short in the straw, it produces heavy crops of green stuff and hay, and the quality of the hay is excellent. The grain is small, but the yield is particularly heavy under our conditions. As a grazing crop it is appreciated for the quickness with which it recovers again when stock are withdrawn. It is probably the most useful oat yet tried on large areas at the College, but it is subject to rust, and its grain is less attractive than that of some of the newer types.

Amongst the varieties developed in Australia I would mention first the Lachlan oat, bred by J. T. Pridham, and now firmly established in New South Wales and Western Australia. It is one of several selected from a cross between Vilmorin's White Ligowo, a white-grained French variety, and Algerian. It ranks with Cape oats in rate of growth, but is taller and stronger in the straw. The foliage is dark-green, and crop is hardier and stands up better than Algerian oats. The grain is like a well-grown sample of Algerian, but is lighter in color, and a little stouter. It holds its grain well, and yields quite as heavily as Algerian oats in dry districts. It is probably the most promising of the varieties evolved in Australia.

*Bathurst 4 and Bathurst 5*.—Both of these varieties sprang from the same cross as Lachlan, and both are characterised by speedy growth in the autumn. Neither of them has given much promise as a grain producer, but for early green feed and hay they appear to be well suited. Bathurst 5, which is now known as Yarran, is a tall grower, but hardly so strong in the straw as Lachlan. The grain is broad, plump, and of a brownish-red color.

*Glen Innes No. 1*.—This also has the same pedigree as Lachlan, but resembles Algerian more closely in general habit. It ripens more slowly, and hence is suited to the cooler districts. The grain is lighter in color than Algerian, and a little plumper in appearance.

*Guyra*.—This is another oat of similar origin that should suit the cooler districts rather than the drier wheat-growing areas. It ripens off a few days ahead of Algerian oats, and yields either fine strawed hay or a heavy crop of brown well-filled grain.

*Bathurst Early*.—Of all varieties under trial this is the quickest to grow in the autumn. The early growth is erect in habit and dark green in color. It was bred by Mr. Pridham by crossing Algerian with Carter's Royal Cluster, and, although he has since discarded it, as being weak in the straw, it has not yet shown signs of lodging at Roseworthy, and consequently we are still keeping it under observation. The grain is attractive, being broad and well filled, and of a

brown color, and, as will be seen from the tables, the yields have been very good.

*Cowra 22* is a selection from Ruakura, which it closely resembles. Being stronger in the straw and quicker to grow it should prove useful in the cooler parts both for hay and grain. Our experience with this variety is limited to one season, but it will be further tested, and if it fulfils the promise shown both as hay and grain producer, seed will be made available to farmers.

*Cowra 25*.—This is an improved form of the variety known as Sunrise, which was selected from Algerian, and is believed to be a natural crossbred. Cowra 25 does not grow so tall as Sunrise, but it stools better and yields a large, plump, yellowish grain. It has not proved a heavy grain producer, but it has inherited the quick-growing habit of Sunrise, and, being finer in the straw, it cuts better quality hay.

*Kelsall's*.—A selection by Mr. Kelsall, of the Wimmera, from a crop of Algerian or Calcutta oats. A very early oat, characterised by fine, relatively short straw and long, narrow, yellow grain. It stools well, ripens off evenly, and yields heavy crops of grain. For short season districts it is certainly worthy of a trial.

For the purpose of ready reference I have compressed into the appended table particulars concerning characteristics and yielding capacity of these varieties:—

*Particulars of Some Varieties of Oats.*

	Origin.	Straw.	Grain.	Earliness.
LACHLAN .....	White Ligowo x Algerian .....	Stronger than Algerian	Lighter in color and stouter than Algerian	Early
BATHURST 4, 5 ...	.....	Tall, might be stronger	Brown, plump .	Early
GLEN INNES 1 ....	" .....	Similar to Algerian	Light brown, fairly plump	Medium early
GUYRA .....	" .....	Similar to Algerian	Brown, plump .	Medium early
KELSALL'S .....	Selection from Algerian .....	Short, fine ....	Long, narrow, yellow	Very early
RUAKURA .....	" .....	Tall, but weak	Yellow and narrow	Medium early
COWRA 22 .....	Selection from Ruakura .....	Stronger than Algerian	Light brown, medium size	Early
SUNRISE .....	From Algerian, natural crossbred	Very tall .....	Large, yellowish white, plump	Early
COWRA 25 .....	Selected from Sunrise .....	Tall .....	Darker than Sunrise	Early
BATHURST EARLY .	Algerian x Carter's Royal Cluster	Tall .....	Brown, broad, plump	Very early
SCOTCH GREY ....	The Dun oat of Scotland .....	Short and fine .	Short, grey, plump	Early
EARLY BURT ....	The May oat of U.S.A. ....	Short, fine ....	Resembles Algerian in shape, but much lighter	Very early
KHERSON .....	Kherson district of Russia .....	Short and fine .	Small, thin, light yellow	Early
SMYRNA .....	From U.S.A. ....	Short, fine ....	Long, narrow, yellow	Early
STARK'S HOOMAKER	" .....	Tall .....	Large, dark, and yellow	Early

*Table of Yields of Oats Obtained at Roseworthy College, 1918-1920.*

	1918.		1919.		1920.		Average Yield. 1918-1920.	
	B.	L.	B.	L.	B.	L.	B.	L.
Lachlan . . . . .	—	—	42	29	57	6	49	38
Scotch Grey . . . . .	49	17	31	12	55	15	45	15
Early Burt . . . . .	—	—	48	3	36	27	42	15
Cowra 22 . . . . .	—	—	—	—	36	4	36	4
Guyra . . . . .	—	—	16	1	55	29	35	25
Kherson . . . . .	29	29	22	19	55	9	35	32
Ruakura . . . . .	21	3	36	24	46	12	34	26
Bathurst Early . . . . .	—	—	37	16	31	7	34	12
Kelsall's . . . . .	17	28	33	3	49	2	33	11
Stark's Hooimaker . . . . .	41	26	21	3	32	9	31	26
Smyrna . . . . .	19	9	26	1	49	13	31	21
Glen Innes No. 1 . . . . .	—	—	—	—	30	22	30	22
Sunrise . . . . .	25	33	15	27	46	4	29	8
Bathurst 5 . . . . .	—	—	21	15	34	21	27	38
Bathurst 4 . . . . .	—	—	21	15	33	27	27	21
Cowra 25 . . . . .	—	—	—	—	20	0	20	0

## QUALITY IN OATS.

The quality of an oat sample depends largely upon the ratio of the outer husks of the grain to the kernel itself, and this ratio is found to vary according to variety and the conditions of growth. On the average the proportion is 30 of husk to 70 of kernel, but it ranges from below 20 to over 40 in extreme instances. One would naturally expect to find that the percentage of husk was highest in the lean, narrow types, and that some definite relation would be found to exist between the weight per bushel and the percentage of kernel, but this is not necessarily so. The proportion of hull will sometimes be found to be highest in short shotty samples, and sometimes in long slender ones according to the conditions of growth and the adaptability of the variety to those conditions. The hull is formed before the grain, and hence, when any climatic disturbance checks the filling of the kernel, the proportion of husk is thereby increased. Hence it is in dry districts that the ratio of husk to kernel is generally highest.

The importance of maintaining a high percentage of kernel is made clear by reference to the dietetic values of the component parts of an oat grain. The following figures, taken from an article by Dr. Crowther, are instructive:—

	Whole Grain.	Kernel.	Inner Husk.	Outer Husk.
	%	%	%	%
Moisture . . . . .	12.27	11.53	9.43	9.71
Albuminoids . . . . .	8.45	10.94	2.77	1.75
Oil . . . . .	4.95	6.63	0.46	0.38
Fibre . . . . .	9.45	2.10	29.85	31.33
Soluble carbohydrates . . . . .	62.47	66.83	51.01	52.49
Ash . . . . .	2.41	1.97	6.48	4.34

The striking facts revealed in this table are, first, the richness of the kernel in the chief food nutrients, namely, albuminoids and fats; and, secondly, the great concentration of comparatively indigestible fibre in the husks. The latter has practically the same composition as

straw, and beyond the fact that they serve a useful purpose by acting as a diluent for the nutrients in the kernel and possibly as a mechanical digestive stimulant, their presence in a foodstuff is of very little value. From this it follows that in comparing samples of oats from the standpoint of the miller or stock feeder, the percentage of husk is a very important factor. Through the courtesy of Mr. J. T. Pridham, plant breeder in New South Wales, I am in a position to quote the mean records for three consecutive seasons in respect of several varieties of oats grown in Australia and one or two imported types:—

*Percentage of Husk to Kernel.*

	1912.	1913.	1914.	Means.
	%	%	%	1912-1914.
				%
Sunrise . . . . .	27.14	25.14	24.69	25.65
Guyra . . . . .	27.68	26.82	26.86	27.12
Kherson . . . . .	27.38	29.05	26.85	27.76
Lachlan . . . . .	30.22	32.34	26.62	29.72
Bathurst Early . . . . .	—	30.19	—	30.19
Buakura . . . . .	—	32.03	28.76	30.39
Algerian . . . . .	31.37	32.25	29.49	31.03
White Tartarian . . . . .	36.56	22.11	35.62	31.43
Storm King . . . . .	36.73	—	—	36.73
Tartar King . . . . .	39.94	—	—	39.94

In so far then, as quality is influenced by the proportion of husk, the newer types occupy a position of advantage in respect of the standard variety, Algerian, and this should be borne in mind when comparing yields.

*TREATMENT UNDER TEST.*

I am afraid that, as a rule, the treatment meted out to oats in South Australia is by no means generous. To their own disadvantage oats have acquired a reputation for thriving under conditions that would spell disaster to any other cereal, and consequently they are rarely afforded an opportunity of demonstrating how they can respond to liberal treatment. Whilst it is quite true that oats are relatively indifferent to the class of soil, they certainly do better on land in good physical condition and a high state of fertility than in roughly worked land that has been heavily cropped. I attribute the low average yield for the State to the sowing of oats on land that is regarded as too poor to carry other crops, and to the small amount of manure, if any, allotted to this crop. It would certainly pay to apply up to 1cwt. per acre of superphosphate to all oat crops sown on medium or inferior land, and where trials are being made of the varieties above mentioned. I trust this fact will not be overlooked. Oats are grateful for phosphates, and in the drier parts the stimulus which phosphoric acid gives to germination, root production, and early development goes a long way towards establishing the crop early. This is most important in districts where it is desirable to have the oats ready for stripping before the wheat crops ripen off, and this affords one further argument in favor of an early maturing oat.

Mr. H. Tarrant (Moorak) asked which class of oats could be recommended for early grazing. Mr. Colebatch suggested a trial of Early Burt, Scotch Grey, Kherson, or Lachlan. Mr. J. R. Beck (Wynarka) asked how long oats should be grazed when one intended harvesting the crop for grain later on. Mr. Colebatch said that at Roseworthy Agricultural College they found that it was not profitable to graze wheat after the end of June. With oats, however, he thought they could be quite safely grazed into the middle of July. Mr. J. Smith (Hawker) wanted to know a good oat for growing in the very dry districts. Mr. Colebatch recommended the Lachlan as one that was giving the best results in many of the dry districts of the other States. Mr. Boardman (Moorak) asked if the "Black Tartar" oat had been tried at the College. Mr. Colebatch informed the inquirer that that variety had been tried. It was generally known as "Tartarian." It grew best under moist and marshy conditions where many of the other varieties would not thrive. It would not be recommended as an oat for general farm purposes. One of the delegates from the Gladstone Branch asked what sort of drill was used for sowing Scotch Grey oats, to which Mr. Colebatch replied that if a decent sample of oats was obtained, there would be no difficulty in putting the seed through an ordinary drill. In reply to Mr. S. L. Butler (Butler) as to which oat was the best preventive for take-all, Mr. Colebatch said that was quite a new question to him. Neither one oat nor another differed in that regard. Oat crops were sown to break the continuity of the disease and to prevent the fungus from carrying on into the next crop of wheat. In reply to Mr. R. Wheaton (MacGillivray) Mr. Colebatch said he believed if early sown oats were grazed there would not be so much danger of the plants being attacked with rust. Mr. A. L. McEwin (Blyth) did not believe that the full value of oats for feeding purposes was recognised by the majority of the farmers. He strongly advised farmers to sow oats liberally on the stubble land. Mr. F. Coleman (member of the Advisory Board of Agriculture) said he wanted to endorse what had been said by Mr. Colebatch with respect to the growing of new varieties of oats in the different districts of the State. The Lachlan oat, one of the new varieties tried by Mr. Colebatch, had struck him as being one of the most promising varieties for the Saddleworth district. The dairying industry at the present time was one of the most promising and flourishing industries in the State, and to those men who were interested in the dairy business and wanted an oat with a fair amount of feeding value he recommended the Lachlan.

*(To be continued.)*

## STATE OF SOUTH AUSTRALIA.

### CEREAL AND HAY AREAS UNDER CROP, 1921-22.

From information collected from individual farm holders, the Government Statist estimates the total area under crop for grain, hay, and fodder to be as follows:—

*Wheat*.—2,726,266 (2,501,448) acres. Increase, 224,818 acres.

*Barley*.—175,231 (205,400) acres. Decrease, 30,169 acres.

*Oats*.—357,824 (413,379) acres. Decrease, 55,555 acres.

*Grand Total*.—Wheat, barley, and oats for all purposes, 3,259,321 (3,120,227) acres. Increase, 139,094 acres.

### DECENNIAL COMPARISON OF AREAS CROPPED.

A review of the area cropped for grain, hay, &c., for the past decennial period shows a rapid rise in wheat from 2,579,560 acres in 1912-13 to 3,220,645 acres in 1915-16, and then a continual decrease to 2,449,837 acres in 1919-20, since when there has been a recovery. Barley and oats begin the decennial period with 71,869 and 316,520 acres respectively, rising to 205,400 and 413,379 acres in 1920-21, with expected decreases on those totals of 30,169 and 55,555 acres for the present season.

*Wheat Yield, 1921-22*.—Particulars for estimating the yield will be collected as usual next December. The prospects up to the present are generally very favorable for a yield per acre well above the mean of the last 10 seasons, and with the extra 224,818 acres under crop and fair weather conditions for the remainder of the season an aggregate yield of over 30,000,000bush. may be reasonably anticipated.

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## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Friday, October 14th, there being present Mr. C. J. Tuckwell (Chairman), the Director of Agriculture (Professor Arthur J. Perkins), the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch), Messrs. G. Jeffrey, T. H. Williams, W. G. Auld, and the Secretary (Mr. H. J. Finnis). An apology was received from Mr. H. Wicks.

*The Dairying Industry.*—An intimation was received from the Minister of Agriculture to the effect that a draft Bill dealing with the dairying industry was under consideration. It was decided to request that a copy of the proposed Bill might be made available to the Board prior to its introduction to Parliament.

*Extension of the Moorook Irrigation Area.*—Correspondence was received from the Moorook Branch stating that it viewed with grave concern the proposed extension of the irrigation areas in that district. The Branch pointed out that the greater portion of the land that it was intended to place under irrigation was practically useless, and that to extend the irrigable area would not be in the best interests of agriculture. The matter was referred to the Director of Irrigation, who stated that in view of the reports that had been obtained, approval had been given not to proceed any further with the extension of the irrigable land at Moorook. The Secretary was instructed to advise the Branch of the decision of the Department of Irrigation.

*Fencing Act.*—The Gawler River Branch carried the following resolution:—"That the portion (half) of the fence on the right-hand side of the adjoining landholders, when they stand each on his own property and facing each other, be under the care of those respective landholders." The matter was referred to the Commissioner of Crown Lands, who stated that he could not recommend any amendment to the Act at present. It was decided to inform the Branch of the Minister's decision.

*Bulk Weighing of Wheat.*—At the recent Conference of Pinnaroo Line Branches of the Agricultural Bureau it was resolved—"That this Conference favors the bulk weighing of wheat in preference to the single bag system." The Wheat Scheme reported thereon:—"The Board note the resolution carried at the recent Parilla Conference, in respect to the bulk weighing of wheat, in preference to the single bag system, but would point out that as the operations of the Board will not apply to the forthcoming harvest, no action can be taken so far as the Board are concerned; the resolution, therefore, should be forwarded to the wheat merchants for consideration. The Board, however, express the opinion that the system of bulk weighing cannot be placed upon a satisfactory footing until up-to-date weighbridges are installed at the principal wheat centres, controlled by responsible and capable weighers, who in turn would be governed by necessary legislation. In Victoria most of the wheat is taken from the farmer under

the bulk system, the weights being obtained on railway or shire council weighbridges; and the whole of it is sold and shipped on weights obtained on railway weighbridges at Williamstown, Geelong, and Portland by sworn weighers. The outturn of shipments of Australian Wheat Board wheat overseas show that the best results of the four wheat States have been obtained by Victoria."

*Resolutions Carried at the Thirty-Second Annual Congress.*—The Board decided to forward the following resolutions of Congress to the Minister of Agriculture:—(a) "That steps should be taken to preserve the timber growing on the bends of the River Murray, and that the Forestry subcommittee of the Advisory Board be authorised by the Government to visit the river and report;" (b) "That this Congress emphatically protests against the wicked and wilful waste of timber in this State, especially along the River Murray;" (c) "That this Congress urge on the Government to make provision at the Government Produce Depot, at Port Adelaide, for the handling of pig products, and to make trial shipments to test the markets;" (d) "That this Congress urge on the Government the necessity for taking steps to open out and organise the export trade in pork;" (e) "That this Congress requests the Government to adopt Mr. Quinn's suggestion regarding the appointment of itinerary instructors."

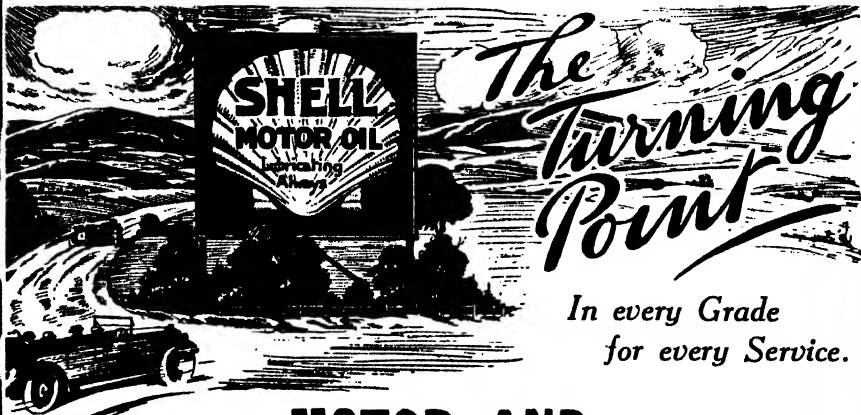
The following resolutions were also transmitted to the Minister in support of previous recommendations of the Board:—(a) "That the Government be urged to start an experimental farm on the reclaimed areas of the Murray, with the following provisos: (a) that the site be not selected from a choice portion of the swamp, and (b) to experiment in treating the inferior classes of soils and fodder crops;" (b) "That the Government be requested to appoint veterinary surgeons for outlying districts, including Eyre Peninsula;" (c) "That steps should be taken to secure Imperial preference for dried fruits."

The following resolutions were received:—(a) "That this Congress recommends that the Government should strictly enforce the personal residence clause in leases;" (b) "That this Congress recommends that the Government appoint an Inspector of Apiaries;" (c) "That this Congress urges upon the Government the necessity for introducing an up-to-date Apiaries Act, such Act to provide for, among other things, the registration of apiaries."

It was decided to submit the following resolution with the strong recommendation of the Board to the Minister of Agriculture:—"That this Congress recommends that the Winter School held at Roseworthy should be repeated during the year 1922."

The Board expressed its approval at the decision of the Congress—"That we, the delegates of the Thirty-second Annual Congress, pledge ourselves to discuss the subject of afforestation at our meetings during the ensuing year."

It was also resolved—"That this Congress urges on the Government to compel wheat merchants to supply farmers with carbon copies of the weights of individual bags of wheat delivered." On the motion of Mr. W. Auld, seconded by Mr. W. J. Colebatch, it was decided to draw the attention of the Government to the fact that a promise was



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made that carbon copies of weights of individual bags of wheat would be issued to farmers in connection with the 1920-21 harvest, but so far as the Board was aware, this was not done.

*Visits by Officers of the Department to West Coast Branches.*—“That this Congress expresses its regret that the Government did not arrange for the Superintendent of Experimental Works, the Secretary of the Advisory Board, and a veterinary surgeon to visit Branches of the Agricultural Bureau on Eyre Peninsula during last year as requested, and desires that the visit be made during the coming year.” Members of the Board were very anxious that the Branches on Eyre Peninsula should be kept in touch with the work of the Bureau, and the Secretary was instructed to request the Government to place at the disposal of the officers of the department a motor car to enable them to make the visit.

*Date of Next Meeting.*—It was decided that the next meeting of the Board should be held at Roseworthy Agricultural College on Wednesday, November 9th.

It was decided to visit the Kybybolite Experimental Farm on November 23rd.

*Dried Fruit Moth.*—The following resolutions were received from the Renmark Branch:—“The Renmark Branch of the Agricultural Bureau, representing every section of grower, view with alarm the depredations of the fruit moth, and being strongly of the opinion that excellence of sample is of paramount importance for a successful export trade, urges the Government to aid the A.D.F.A. in taking necessary steps for the sterilisation of dried fruits;” also “That the Advisory Board be asked to employ an entomologist to study the life history of the fruit moth, and also to find out what degree of heat is necessary to cause the sterilisation of the egg.” The Board decided to submit the matter to the Minister and support the recommendation.

*Veterinary Surgeons.*—A resolution was received from Morchard asking the Government to subsidise the amount required as a guarantee by the Veterinary Surgeons’ Association to place veterinary surgeons in country districts. It was decided to inform the Branch that the idea was that the guarantee should be undertaken locally.

*Life Member.*—The name of Mr. J. Malcolm, of the Kadina Branch, was added to the list of life members of the Agricultural Bureau.

*Branch to be Closed.*—It was decided to close the Yabmana Branch.

*New Branch.*—Approval was given for the formation of a Branch at Owen with the following gentlemen as foundation members:—H. and L. Bowver, W. and C. Baker, A. S. Evans, A., T. A., and H. Freebairn, R. H. Hancock, R. S. Harkness, H. A. Helps, J. Healy, F. A. Hill, S. C. Lacey, W. J. B., E. R., and C. L. Marshman, H. Moeller, — McPharlin, A. March, W. J. Pavy, D. S. Shakley, W. Snook, V. Scott, W. Wood, W. J. Goodall.

*New Members.*—The following names were added to the rolls of existing Branches:—Yaninee—F. Rehn, C. H. Scholz, F. Christian, E. Hirschfeld; Winkie—F. A. Ross, F. P. Wasley, G. Smith; Laura—

A. Hartman, jun.; Yadnarie—H. L. Jarrett; Koppio—S. Cooper, H. Roberts; Balhannah—F. W. Clasholm, F. T. Norsworthy, W. C. Jennings; Longwood—A. Boyes; Renmark—A. McCulloch, A. Sonnermann; Lone Gum—W. Darbyshire, L. Elleway, A. Johansen; Gladstone—C. Hollitt; Black Springs—C. McLachlan, S. Lock; Salt Creek—B. A. Rudiger; Strathalbyn—W. J. Fisher, W. G. Watt; Mount Gambier—C. B. Claxton, H. Major, G. Hill; Pinnaroo—P. Stiller, M. Stiller, F. Dibben, E. Dibben; Lone Pine—E. Helling; Rockwood—S. G. Hales, F. C. Wells, T. Langley, E. T. Rogers, D. Watson; Paskeville—J. N. Abbott, F. C. Couzner; Clare—T. Smith; Windsor—W. W. Prime, E. Manuel, E. Jenkins; Virginia—R. Legoe, J. H. Day, A. Barker; Rosedale—S. Gursansky; Waikerie—J. B. Murdoch, W. Jacobs, J. Ohlmeyer, T. Taylor, A. H. Headland, H. Heinemann; Mount Barker—T. Vitson; Yacka—W. Gent, B. Langrehr, H. Murphy; Lameroo—J. O. Kernich, W. Krievaldt, F. Krievaldt, H. G. Eime; Aldinga—C. G. Bird, W. R. Crisp, H. Eatt, H. Stanfield; Watervale—W. Hamp, L. Bartlett; Meadows—E. A. Saint, W. G. Thompson; Bartley—C. Hassam, A. Jaensch; Blyth—F. W. Heinrich, H. L. Plush; Salisbury—C. Koch; Williamstown Ladies—Mrs. R. Filsell, Mrs. E. Haworth, Miss A. Wilson, Miss D. Newett; Ashbourne—C. Moore, J. South, L. Cuming; Saddleworth Ladies—Mrs. J. B. Coombe.

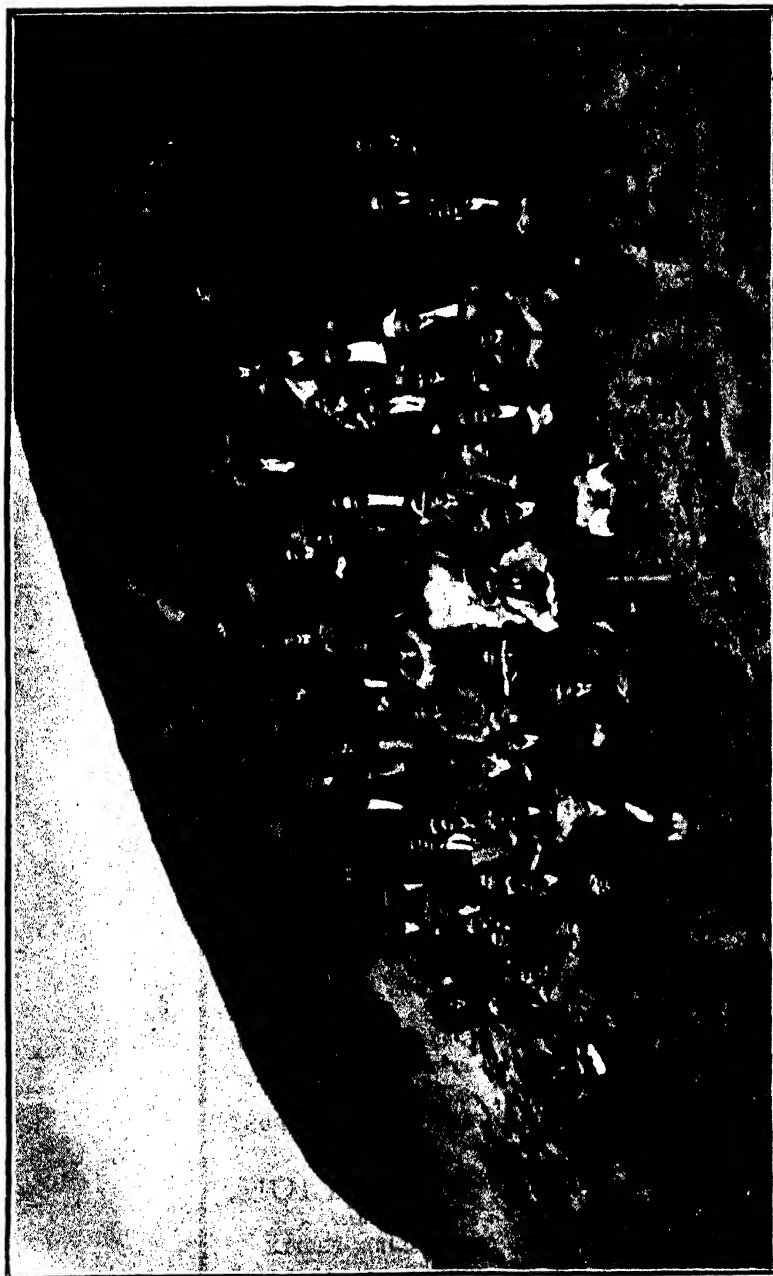
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Delegates at the Second Annual Conference of the Eyre Peninsula Branch of the Agricultural Bureau on the Yarwondutta Rocks, which form a catchment for the water supply for the Government Experimental Farm, Minnipa.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

### CONFERENCE OF EYRE PENINSULA BRANCHES.

On October 20th and 21st, representatives of the Eyre Peninsula Branches of the Agricultural Bureau met in conference for the third successive year at the Government Experimental Farm, Minnipa. This conference, in several ways, differs from conferences held in other parts of the State. In the first place it is the only district which so far has made a practice of meeting at one of the Government Experimental Farms. Secondly, the huge area which the conference represents, and the distances which delegates have to travel, in many cases over bush tracks, lend to it some of the attractions, and probably most of the disadvantages associated with an exploration expedition. This aspect is emphasised, too, by the fact that the absence of hotel accommodation forces on delegates the necessity for "camping out." These difficulties notwithstanding, over one hundred representatives foregathered, and at the close of the conference unanimously resolved to meet again at the same place next year.

#### THE VISITORS AND DELEGATES.

The Department of Agriculture was represented by the Director of Agriculture (Professor Arthur J. Perkins), the Superintendent of Experimental Work (Mr. W. J. Spafford), the Horticultural Instructor (Mr. Geo. Quinn), and Secretary Advisory Board (Mr. Harold J. Finnis). The Superintendent of Soldier Settlements (Mr. F. C. Grace) and Mr. G. Lane were also present. The Branches represented were:—Minnipa, Petina, Yaninee, Talia, Green Patch, Wudinna, Glossop, Collie, O'Loughlin, and Yeelanna.

#### ADDRESSES AND PAPERS.

##### *The First Day.*

The President of the Minnipa Branch (Mr. G. Lindquist) occupied the chair. The opening address was delivered by the Director of Agriculture (Professor Perkins) who took the opportunity of extending a welcome to delegates, and also of placing before the conference the results achieved on the Minnipa Farm since its inception. A paper entitled "Things Necessary for the Successful Development of Eyre Peninsula," contributed by Mr. R. L. Myers (Mount Hope Branch), was then read. "Portable Engines on the Farm" was the subject of a paper contributed by Mr. P. A. Thompson (Talia Branch). Both of the papers were well discussed. "Free Parliament" was then commenced, and the following resolutions carried:—(1) "That the Advisory Board be asked to investigate the possibility of encouraging the use of high quality stallions amongst farmers by subsidising owners who were prepared to let their horses to neighbors for reasonable fees." (2) "That this Conference strongly urges that the rates charged for water on all tanks and wells on Eyre Peninsula be considerably reduced." (3) "That all applications for the Short Course at the



Delegates who attended the Conference of Eyre Peninsula Branch of the Agricultural Bureau in the Orchard at the Government Experimental Farm, Minnipa.



Roseworthy Agricultural College be sent to the Advisory Board for them to allot which delegates shall be selected, and that preference be given to those Branches which were not represented last year." (4) "That the Government consider the necessity for the appointment of a veterinary surgeon on Eyre Peninsula."

#### TOUR OF INSPECTION.

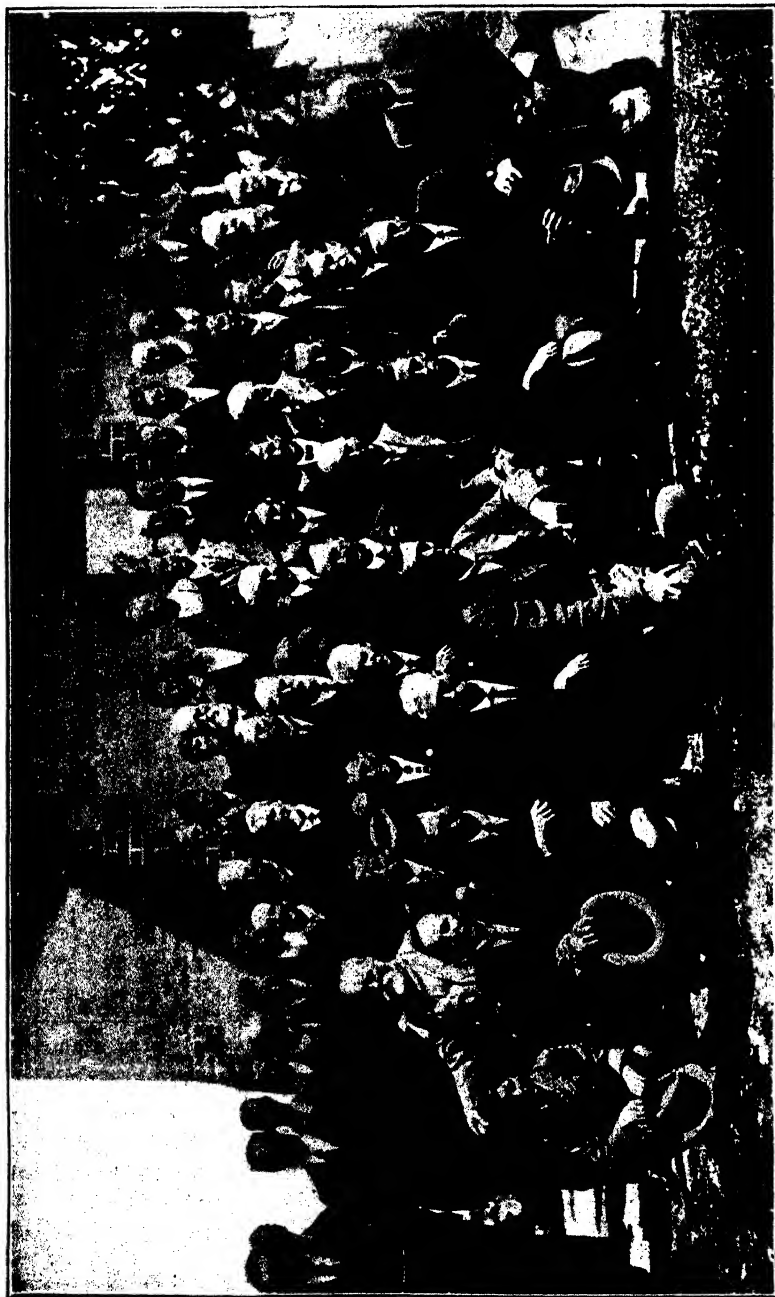
The morning of the second day of the Conference was spent in a tour of inspection of the Minnipa Farm. Sunshine and rain, alternating at frequent intervals, did not deter the party, who tramped through wet undergrowth first to Fields 16 and 17, containing rye, barleys, wheat, rates of seeding and manurial tests, cultivation tests and seed plots, the Manager (Mr. R. Hill) the while explaining the operations. The orchard was then visited, and subsequently a course directed to Fields 5, 6, and 2, in the last of which are situated the selection and other hand plots. The Yarwondutta Rocks, the source of the Farm water supply, proved of considerable interest, after inspecting which the party travelled towards the Farm buildings, passing en route Field 13A under crop for hay.



Portion of the Stables on the Government Experimental Farm, Minnipa.

#### SESSIONS CONTINUED.

The afternoon session was inaugurated by a paper by Mr. G. Lindquist (Minnipa Branch), entitled "Conservation of Fodder for Stock." Free Parliament was then continued, and the following resolutions were carried:—(1) "That the next conference be held at Minnipa on the third Thursday and Friday in October." (2) "This conference strongly urge upon the Advisory Board to ask His Excellency the Governor to be present next year." The evening session was devoted to addresses by Mr. Geo. Quinn, who dealt with the varieties of fruits suitable to the district, and Mr. W. J. Spafford, who took as his subject the varieties and cultivation of wheat.



Delegates who attended the Conference of Hills Branches of the Agricultural Bureau.

### CONFERENCE OF HILLS BRANCHES.

The annual congress of Hills Branches was held at Longwood on Thursday, October 13th. The gathering was opened by the Hon. T. Pascoe, M.L.C., in the presence of Mr. C. J. Tuckwell (Chairman of the Advisory Board of Agriculture), Mr. H. H. Corbin, B.Sc. (Consulting Forester and Lecturer in Forestry, University of Adelaide), Mr. Geo. Quinn (Horticultural Instructor), Mr. H. Wicks (Member of the Advisory Board of Agriculture), Mr. H. J. Finnis (Secretary of the Advisory Board of Agriculture), Mr. R. Fowler (Manager of the Blackwood Experimental Orchard), and a large number of delegates and visitors. An address, "Forestry," was delivered by Mr. H. H. Corbin, B.Sc., and the following papers were contributed:—"Electricity and Plant Life," Mr. R. Higgins (Longwood); "Irrigation and Pumping Plants for the Hills," Mr. H. Hoffinan (Uraidla); "Commercial Poultry Raising," Mr. E. W. Beytheim (Longwood); "Cooperation," Mr. C. Ricks (Cherry Gardens) and Mr. W. Nicholls (Longwood); "Fruit Growing," Mr. A. Filsell (Balhannah); and "Observations during a trip to New Zealand," Mr. R. Fowler (Manager of the Blackwood Experimental Orchard). The following resolutions were carried:—(1) "That the Advisory Board be asked to return to Branch Secretaries original papers, so that they may be kept by Branches for reference." (2) "That once every year names of officers and members of each Branch be published in the July issue of the *Journal of Agriculture*." It was decided that the next conference should be held at Cherry Gardens. An excellent display of produce of the district was tabled by the local Branch.

### CONFERENCE OF MURRAY LANDS BRANCHES.

The second annual conference of Murray Lands Branches of the Agricultural Bureau was held at Karoonda, on Thursday, the 27th. The opening session of the conference was presided over by Mr. C. S. Coombes, and the succeeding session by Mr. V. V. Brown. The Department of Agriculture was represented by the Director of Agriculture (Prof. A. J. Perkins), the Assistant Dairy Expert (Mr. H. J. Apps), and the Secretary Advisory Board (Mr. H. J. Finnis). The conference was opened by Professor Perkins, who after apologising for the absence of the Minister of Agriculture and Members of the Advisory Board, referred to the interest that was being taken in the work of the Agricultural Bureau by mallee Branches generally. He then proceeded to deal with the question of "Takeall," the remedy for which he stated was wrapped up largely in the gradual bringing about of what were regarded as normal conditions of farming. The general experience of other new mallee areas was that whilst the disease was troublesome at the beginning of operations there was a tendency gradually for it to disappear. He mentioned that with the object of discovering some other factors that might improve the position, if such were possible, a survey of the disease and

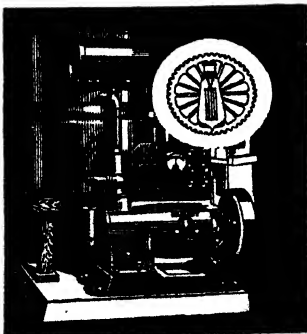
its incidence was being made throughout the State by the Plant Pathologist (Professor T. G. B. Osborn). In discussing the agricultural outlook, the Director mentioned that generally, the season was promising, a fact on which he congratulated the district. Papers were read by Messrs. J. R. Beck, of Wynarka, and V. V. Brown, of Borrika, and each of these were subjected to a good deal of interesting discussion; then followed an address by the Assistant Dairy Expert (Mr. H. J. Apps), who amongst other matters, discussed the relative merits of different breeds of cattle from the point of view of that district, expressing the view that in the Ayrshire and Milking Shorthorn, the farmers would find their requirements best met. He then spoke of the characteristics of milking cattle, and outlined a number of points dealing with the rearing of calves. In the evening, the Director of Agriculture delivered an address dealing with the rotation of crops, and Mr. E. W. Cowled contributed a paper dealing with "Gardening on the Farm."

#### RESOLUTIONS.

The following resolutions were carried:—(1) "That this conference ask the Railways Commissioner to increase the time allowed for loading trucks in this district from three to eight hours." (2) That the Railways Commissioner be asked to keep to his promise to provide residents of the Peebinga line with a rake of trucks when ordered." (3) "That the Advisory Board approach the Government with a view to their undertaking steps to find a market for cured pork."

#### PLACE OF NEXT CONFERENCE.

It was unanimously decided, on the motion of Mr. E. W. Cowled, that the conference should be held again next year in the first week in October at the Government Experimental Farm, Veitch.



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## ORCHARD NOTES FOR THE SOUTHERN DISTRICTS.

[By CHAS. H. BEAUMONT, Horticultural Instructor, &c.]

Spraying is the most important work in both orchard and vineyard. Keep on spraying to check both insect and fungus pests. Do not worry about what your neighbor may or may not be doing; see to it that your own are properly attended to.

Spray against "codlin moth." Spray against "root borers." Spray against "red spider." Spray against "woolly aphis," "peach aphis," and "orange aphis." Spray against "cut worms." Spray against "shot hole" on apricots, cherries, and plums, especially Japanese plums. Spray against "downy mildew" and "oidium" and "anthracnose."

Ploughing and cultivating should be completed, and the soil be loose and free from weeds. Use the cultivator after heavy showers, which tend to set the ground.

See that you have a good supply of cases ready for the coming crops. Get your drying trays ready to deal with any surplus, so that there will be no waste. Try drying whole apricots. They must be large and fleshy and clean. Dip for 10 seconds in a solution of 1lb. of caustic soda in 30galls. of water, boiling; rinse in clean water, and put in the sulphuring box at once, for two or three hours, then into the sun. Whole apricots are the best product you can make, in appearance, and for use, and cost much less than the halves.

Have all your appliances for jam making and canning ready; material not suitable for drying or canning will make good jam.

Use all possible care in picking and marketing your fruit. Good fruit is very often bruised and its appearance spoiled by rough handling, and the price obtained is, of course, very much lower than it need be.

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## ORCHARD NOTES FOR THE NORTHERN DISTRICTS.

[By J. B. HARRIS, Horticultural Instructor.]

The Secretary of the Williamstown Agricultural Bureau recently drew my attention to some small caterpillars enclosed in a case constructed by the insect of web-like material, having what appeared to be tiny fragments of dead leaf and stick adhering to it. The cases varied in size, but the majority were half an inch long and conical in shape. The head of the caterpillar was at the base of the bag or case, that being the point at which the bag is joined to the tree. Small portions of bark had been devoured by the caterpillars from the shoots of the past season's growth, the injury having exactly the appearance of that caused by what is commonly called the curculio beetle. The number of these insects found on young trees was not more than four

or five in each case, and the greatest area of bark devoured in one place was not more than 1in. in length. In many cases the bark eaten was directly below the buds.

The following information regarding these insects was supplied by the Horticultural Instructor (Mr. Geo. Quinn):—"The insects are quite well known as native to our scrubs, and occasionally a few transfer their attention to the fruit trees. I have never known them to do serious harm because they are suppressed very severely by parasitic wasps. If you try to hatch the moths from the fully-grown caterpillars, the usual result ends in a number of wasps emerging from the chrysalis case and no moth. The mother wasp deposits her eggs inside the "bag" or on the caterpillar itself, and natural courses take their sway. If you think it worth while you can poison the caterpillar by spraying the affected trees with arsenate of lead, 1lb. in 12galls. of water, but I do not think it will be found worth while."

The latest report from the owner of the trees is reassuring, as no very serious harm has been done, and the pest has now disappeared.

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## MURRAY BRIDGE HERD TESTING SOCIETY.

## RESULTS OF BUTTERFAT TESTS FOR JULY, 1921.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during July.	Per Cow during July.	Per Cow October to July.	Per Herd during July.	Per Cow during July.	Per Cow October to July.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/A	13	10.84	8,165	628.08	5,512.54	391.63	30.13	260.64
1/B	15.19	12.23	6,337.5	417.12	5,430.97	320.89	21.12	243.19
1/C	45.29	38.84	33,853	747.47	5,660.06	1,424.74	31.46	233.48
1/D	18	17	11,315	628.61	4,864.05	549.50	30.53	240.98
1/E	15	12	7,122	474.80	5,341.20	338.83	22.59	255.32
1/F	11	8.13	4,851	441.00	4,816.63	208.62	18.97	201.64
1/G	49.32	41.48	34,783.5	705.22	7,996.49	1,429.20	28.98	305.87
1/H	17.48	13.39	7,273	415.98	4,725.76	340.39	19.47	207.72
1/I	10.61	6.61	4,784.5	450.82	5,998.51	221.87	20.91	253.69
1/J	16	14.16	7,850.5	490.66	6,002.80	383.86	23.99	273.85
1/K	13	11.19	5,105	392.69	5,267.53	273.60	21.05	238.70
1/L	13	7.97	5,197.5	399.81	4,987.35	251.91	19.38	229.21
1/M	14	10.61	5,052	360.86	3,835.34	273.00	19.50	183.51
1/N	—	—	—	—	2,301.68†	—	—	100.07†
1/O	32	27.06	20,209.5	631.55	3,917.88*	932.00	29.13	181.86*
1/P	18	15.19	8,270.5	459.47	3,647.13*	409.34	22.74	166.87*
1/Q	—	—	—	—	1,241.91‡	—	—	49.01‡
1/R	11.77	11.77	7,381	626.88	1,758.96§	356.19	30.25	85.51§
MNS.	19.54	16.15	1,109.69	567.87	5,629.07	506.60	25.92	244.49

\* For eight months only. † For four months only (withdrew from society). ‡ For two months only (withdrew from society). § For three months only.

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## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on November 1st, 1921:—

**BUTTER.**—Owing to discouraging reports of the London butter markets, and buyers not operating, values throughout the month further eased. There is still a considerable quantity of last season's butter on hand, and this is affecting values, so that with large quantities leaving Australia, it is feared that prices will not improve. It will really take London buyers all their time to cope with the stocks of butter on hand and to arrive. At the close of the month here first-grade factory and creamery, in prints, sold at 11½d. to 12½d.; best separators and dairies, 10½d. to 11½d.; fair quality, 9½d. to 10d.; well-conditioned store and collectors', 9d. to 9½d.; weather-affected lots down to 8½d.

**EGGS.**—Heavy quantities from New South Wales, Victoria, and South Australia have been shipped to London, and this has had the effect of firming rates. Local picklers and pulp manufacturers have been anxious to secure their requirements, having in view the quality of eggs being now at its best, so that markets have been readily cleared, and prices during the month have advanced. Fresh hen eggs at the end of the month sold at 12d.; duck, 12½d.

**CHEESE.**—Values are easier in sympathy with the lower rates ruling for butter and owing to the anxiety of some holders to quit, so that concessions have been made to effect quittance, range at the close of the month being 6½d. to 7½d. for large to loaf.

**HONEY.**—For prime clear extracted there has been a better outlook, and already buyers are asking quotations for new season's lots. Present values are 4d. per lb. for prime clear extracted; but second grades are unsaleable at 2½d. Beeswax wanted at 1s. 10d.

**ALMONDS.**—Advanced 1d. per lb. during the month, while kernels showed an improvement of 3d. per lb. Stocks are very light, and buyers are unable to obtain all their requirements. Brandis selling at 13½d.; mixed softshells, 12½d.; hardshells, 5½d. to 6d.; kernels, 2s. 4d.

**BACON.**—During the month values in the live market have fluctuated somewhat, but prices for bacon steadied. Supplies coming forward have been quite equal to demand. Best factory cured sides sold at 1s. 2d. to 1s. 2½d.; hams are in much better request, and prices have firmed, sales being made at 1s. 5d. Lard in packets, 8½d.; bulk, 8d.

**LIVE POULTRY.**—Although increasing quantities have come forward during the period, the active demand has readily cleared all offering. Prices have well maintained, and good values are likely to rule from now to Christmas. Prime roosters, 5s. to 6s. 6d.; nice-conditioned cockerels, 4s. to 4s. 11d.; plump hens, 4s. to 5s. 3d.; light birds, 2s. 11d. to 3s. 9d.; ducks, 3s. to 6s.; geese, 8s. to 8s. 6d.; turkeys, prime conditioned, 1s. 1d. to 1s. 5d. per lb. live weight; fair conditioned, 11d. to 1s. 0½d. per lb.; fattening sorts lower. Pigeons, 8d.

**POTATOES.**—The market has shown very little variation during the month, heavy supplies of Victorians (olds) being available, and also a fair quantity of locals. On the other hand, new potatoes have been marketed in small quantities, and these from now on will show an increase with the warmer weather conditions. Quotations at close of month were:—Prime Victorians (old), £6 to £7 on trucks, Mile End; new potatoes, 12s. to 14s. per cwt.

**ONIONS.**—From 5s. 6d. to 6s. 6d. per cwt. on trucks, Mile End.

### SWEET CLOVER FOR HORSES AND PIGS.

The following questions, submitted by a correspondent, have been replied to by the Superintendent of Experimental Work (Mr. W. J. Spafford) as set out below:—

*Question 1.* Can sweet clover hay be compared to cereal hay?

*Reply*—It is very difficult to compare sweet clover hay with the cereal hays as they are of different types, and the best comparison can be made with lucerne hay or red clover hay, but for your information, the following analyses are given:—

#### *Analyses of Hays.*

	Water.	Ash.	Crude Protein.	Crude Fat.	Carbo-hydrate.	Crude Fibre.	Remarks.
1. Red Clover hay ...	16.5	6.0	13.5	2.9	37.1	24.0	Actual
2. Sweet Clover hay ...	7.7	7.5	13.3	2.1	42.6	26.9	Actual
3. Lucerne hay .....	10.0	8.9	16.0	2.8	37.7	24.6	Actual
4. Red Clover hay ....	10.0	6.5	14.5	3.1	40.0	25.9	Reduced to 10 p.c. water
5. Sweet Clover hay ...	10.0	7.3	13.0	2.0	41.5	26.2	Reduced to 10 p.c. water
6. Wheaten hay .....	10.0	6.2	5.1	0.8	53.5	24.4	Actual
7. Oaten hay .....	10.0	6.2	7.6	2.5	43.1	30.6	Reduced to 10 p.c. water
8. Oaten hay .....	11.5	6.1	7.5	2.4	42.4	30.1	Actual

You will notice by the above figures that, where the moisture content is made equal, *i.e.*, 10 per cent., the three leguminous hays (Nos. 3 to 5) belong to a type of foodstuffs rich in protein, whereas the cereal hays (Nos. 6 and 7) contain very much less of this nitrogenous feed.

*Question 2.* Is well-cured sweet clover hay suitable for horses at work?

*Reply*—As on lucerne hay, horses will work well on sweet clover hay, and, at the same time, keep their condition, but used by itself, there is rather a large waste of protein, and, as a consequence, better results are likely to result from a mixture of sweet clover and cereal hays.

*Question 3.* Is sweet clover (grazed or cut) a suitable feed for pigs just weaned?

*Reply*—Weaner pigs can be grazed on, or fed with cut sweet clover, to good advantage, but naturally such a feed takes a long time to fatten them, and much waste of valuable protein food results.

*Question 4.* If grain is required for these young pigs, as well as sweet clover, what proportions should be used?

*Reply*—Young pigs will give the very best results if they receive daily about 1½lbs. of finely crushed grain (wheat, barley, or rye) per head whilst being grazed on sweet clover, and if the clover is being cut and carted to them, they will need about 5lbs. to 7lbs. of green sweet clover as well as the grain. Nearly equal results will be secured by using sweet clover hay chaff, and then the piglets should receive each day a gruel made with 1½lbs. finely crushed grain, about 1lb. chaff, and 6lbs. water.

## THE AGRICULTURAL OUTLOOK.

### REPORTS FOR THE MONTH OF OCTOBER.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

*Booborowie.*—Weather—Up to October 21st useful rains fell regularly, with mild weather prevailing, generally speaking. The last week was extremely warm. Up to the time of writing 160 points of rain were registered. Crops—The crops on the whole are good, but the last few hot days have made them look very parched, and at this stage it is difficult to say what effect the intense heat will have upon crops if it continues, without more rain shortly. Natural feed is abundant. Stock are all in good condition, and could not be otherwise at this time of the year, when there is plenty of feed. Pests—The stemless horse thistle appears to be getting a great hold of the country, and more so, I think, than most people realise. Miscellaneous—Shearing is nearly completed. In many instances lucerne is being harvested. Hay harvesting of cereals will commence in a couple of weeks.

*Kybybolite.*—Weather has been changeable, mostly fine calm days, with two rather cold snaps during the month, and finishing with several close, hot days. Rainfall registered 124 points, nearly  $\frac{1}{2}$  in. below the average for the month. A good rain is needed very shortly. Crops are breaking into head, and although there are some really fine crops in the district, the majority suffered too much from the excess of wet in August and September. Early sown summer crops have germinated fairly well. Early peas have set well in pod. Natural feed is plentiful. Stock is in good health. Shearing is nearing completion, a good weight of wool being cut. Pests.—Magpies are a nuisance on the germinating summer crops.

*Veitch.*—Weather—Have received 45 points of rain for the month; average for same month, 92 points. Conditions, generally speaking, have been dry as drying winds followed the light falls of rain. Crops—Early sown fields are showing a satisfactory return; late sown fields are drying off and looking very sick. Natural feed—Best seen in the district for years. Stock—In good healthy condition. Pests—Rabbits are to be seen on every farm. Miscellaneous—Cultivating and scrub rolling operations are now finished, and, in some cases, hay harvesting has started.

*Turretfield.*—Weather—Good falls of rain were received during the early portion of the month, with heavy wind storms. The latter portion of the month was very hot, with drying winds; 172 points of rain were registered. Crops have developed wonderfully, but the dry winds and excessive heat has ripened them off quickly. Natural Feed—Fairly plentiful, but drying off. Stock in good condition. Pests—Thistles and noxious weeds are very numerous this year. Miscellaneous—Haymaking has started on some farms.

## EGG-LAYING COMPETITION, 1921-1922.

HELD AT THE PARAFIELD POULTRY STATION, PARAFIELD, UNDER THE DIRECTION OF D. F. LAURIE (GOVERNMENT POULTRY EXPERT AND LECTURER).

Total No. of Pens.—Section I., Light Breeds (Single Testing), 24—3 pullets in each entry. Section II., Heavy Breeds (Single Testing), 13—3 pullets in each entry. Section III., Light Breeds, 25—6 pullets in each pen. Section IV., Heavy Breeds, 9—6 pullets in each pen.

TWELVE MONTHS' TEST. TO START ON MARCH 1st, 1921, AND TO TERMINATE ON FEBRUARY 28th, 1922.

## SECTION 1.—LIGHT BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENTRY.

Row No.	Name and Address.	Bird No.	Month ending 31/10/21.	Scores to Date.	Bird No.	Month ending 31/10/21.	Scores to Date.	Bird No.	Month ending 31/10/21.	Scores to Date.
WHITE LEGHORNS.										
E	Bamford, W. H., 74, Adelaide Road, Glenelg	1	25	143	2	27	144	3	27	108
E	Connor, D. C., Gawler .....	4	25	112	5	23	114	6	*	*
E	Willington, Mrs. G., Milang ....	7	25	128	8	13	61	9	21	116
E	Nancarrow, J. T., Plympton ....	10	25	89	11	17	77	12	17	99
E	Broadview Poultry Farm, Seaton Park	13	21	108	14	20	99	15	23	99
		16	22	83	17	13	76	18	15	89
E	Stevens, H. J., Broken Hill .....									
E	Monkhouse, A. J., Woodside .....	19	5	42	20	18	104	21	26	134
E	Turvey, D. J., Milang .....	22	22	85	23	25	86	24	24	70
E	Lampert, Mrs. S., Piccadilly ....	25	20	94	26	23	95	27	19	64
E	Nancarrow, J. T., Plympton ....	28	24	114	29	22	110	30	12	88
E	Small, E. W., Mount Gambier ...	31	24	104	32	22	106	33	20	80
E	Coleman, A. C., Grange .....	34	24	96	35	*	*	36	27	104
E	Broadview Poultry Farm, Seaton Park	37	25	116	38	21	91	39	24	99
E	Holmes, F. A., Naracoorte .....	40	19	76	41	22	100	42	22	105
E	Lampert, Mrs. S., Piccadilly ....	43	26	142	44	*	*	45	25	97
E	Green, F. W. H., Monteith .....	46	19	74	47	21	112	48	16	69
E	Howie, H. H., Mount Gambier ..	49	17	95	50	21	91	50	18	90
E	Willmott, H. J., Clarence Park ..	52	16	67	53	14	47	54	*	*
E	Stockman, A., Goodwood .....	55	21	103	56	*	*	57	21	66
E	Green, A. J., Crystal Brook .....	58	24	110	59	16	88	60	17	113
E	Herbert, C., Alberton .....	61	23	67	62	24	105	63	17	88
E	Blake, Mrs. B. L., Berowra, N.S.W.	64	Dead		65	21	117	66	25	104
F	Tilly, P. N., Balwyn, Victoria ...	1	24	100	2	*	*	3	*	*
F	Dugan, T., Lower Light .....	4	26	143	5	25	136	6	24	133
	Totals .....	—	502	2,291	—	408	1,959	—	440	2,015

## SECTION 2.—HEAVY BREED (SINGLE TESTING). THREE PULLETS EACH ENTRY.

## BLACK ORPINGTONS.

F	Lampert, Mrs. S., Piccadilly ....	7	*	*	8	*	*	9	17	144
F	Shaw, R. R., Crystal Brook .....	10	22	95	11	*	*	12	*	*
F	Farr, K. H., Fullarton Estate .....	13	29	160	14	25	157	15	20	112
F	Alford, T., Broken Hill .....	16	*	*	17	*	*	18	30	192
F	Lampert, Mrs. S., Piccadilly ....	19	*	*	20	20	157	21	Dead	
F	Holmes, F. A., Naracoorte .....	22	15	93	23	22	94	24	16	91
F	Shaw, R. R., Crystal Brook .....	25	21	87	26	16	76	27	22	60
F	Wheaton, S. P., Bute .....	28	28	130	29	26	104	30	28	93
F	Bansemmer, Mrs. B., Beaumont ...	31	*	*	32	*	*	33	*	*
F	Farr, K. H., Fullarton Estate .....	34	25	173	35	*	*	36	28	175
F	Mortimer, G., Broken Hill .....	37	23	157	38	28	152	39	*	*

\* Failed under Regulation 12.

## SECTION 2.—HEAVY BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENTRY.

Row No.	Name and Address.	Bird No.	Month ending 31/10/21.	Score to Date.	Bird No.	Month ending 31/10/21.	Score to Date.	Bird No.	Month ending 31/10/21.	Score to Date.
RHODE ISLAND REDS.										
F	Stockman, A., Goodwood .....	40	*	*	41	23	95	42	22	77
F	Tester, G., Naracoorte .....	43	*	*	44	24	83	45	19	50
	Totals .....	—	163	895	—	184	918	—	202	994

## SECTION 3.—LIGHT BREEDS (PEN TESTS). SIX PULLETS IN EACH PEN.

Pen No.	Name and Address.	Breed.	Eggs Laid for Month Ending 31/10/21.	Total Eggs Laid from 1/3/21 to 31/10/21.
1	Anderson, S., Gawler Railway .....	White Leghorns .....	133	785
2	Pugsley, A., Hindmarsh .....	" .....	59	395†
3	Connor, D. C., Gawler .....	" .....	132	682
4	Willington, Mrs. G., Milang .....	" .....	120	623
5	Norton Bros., Seaton Park .....	" .....	119	563
6	Nancarrow, J. T., Plympton .....	" .....	113	518
7	Small, E. W., Mount Gambier .....	" .....	128	664†
8	Buchan, J. S., Seaton Park .....	" .....	128	755
9	Anderson, J., Prospect .....	" .....	123	547
10	Pugsley, A., Hindmarsh .....	" .....	84	484
11	Alford, T., Broken Hill .....	" .....	*	*
12	Pool, F. J., North Norwood .....	" .....	143	608
13	Nancarrow, J. T., Plympton .....	" .....	126	722
14	Smith & Gwynne, Gawler South .....	" .....	137	689
15	Ratten, C. A., Mile End .....	" .....	112	707
16	Howie, H. H., Mount Gambier .....	" .....	136	791
17	Willmott, H. J., Clarence Park .....	" .....	118	497
18	Anderson, Wm., Kapunda .....	" .....	127	720
19	Herbert, C., Alberton .....	" .....	131	650
20	Sparrow, F. H. L., late A.I.F., Beverley .....	" .....	133	746
21	Clee Hill Stud Poultry Farm, Box Hill, Victoria .....	" .....	114	650
22	Beythein, E. W., Scott's Creek .....	" .....	124	625
23	Provis & Sons, W., Tumby Bay .....	" .....	116	692
24	Dugan, T., Wingfield Rifle Range, Port Adelaide .....	" .....	131	672
25	Bansemmer, Mrs. B., Beaumont .....	" .....	147	882
	Totals .....		2,934	15,667

## SECTION 4.—HEAVY BREEDS (PEN TEST). SIX PULLETS EACH ENTRY.

26	Lampert, Mrs. S., Piccadilly .....	Black Orpingtons .....	109	671
27	Farr, K. H., Fullarton Estate .....	" .....	119	689
28	Bansemmer, Mrs. B., Beaumont .....	" .....	—	—
29	Farr, K. H., Fullarton Estate .....	" .....	121	791
30	Lampert, Mrs. S., Piccadilly .....	" .....	*	*
31	Alford, T., Broken Hill .....	" .....	*	*
32	Clee Hill Stud Poultry Farm, Box Hill, Victoria .....	" .....	114	823
33	Lampert, Mrs. S., Piccadilly .....	" .....	122	941
34	Ryan, Jas., Coburg, Victoria .....	Rhode Island Reds ..	134	955
	Totals .....		719	4,870

\* Failed under Regulation 12.

† One bird dead.

## DIVISION B.—STANDARD BREEDS ONLY.

19 Pens each of 6 Birds—114 Birds.

COMMENCING APRIL 1ST, 1921. TERMINATES FEBRUARY 28TH, 1922.

Pen No	Name and Address.	Breed.	Eggs Laid for Month Ending 31/10/21	Total Eggs Laid from 1/4/21 to 31/10/21.
37	*Lampert, Mrs. S., Piccadilly .....	White Leghorns.....	—	—
38	*Newcombe, E. G., Alberton .....	" .....	—	—
39	Packham, C. D., Kensington Park...	" .....	132	531
40	*Beythien, E. W., Scott's Creek .....	" .....	—	—
42	Packham, C. D., Kensington Park...	" .....	106	519†
43	*Newcombe, E. G., Alberton .....	" .....	—	—
44	Belmont Orpington Yards, Evandale.	Black Orpington .....	141	682
45	*Lampert, Mrs. S., Piccadilly .....	" .....	—	—
46	*Farr, K. H., Fullarton Estate .....	" .....	—	—
47	Bansemmer, Mrs. B., Beaumont .....	" .....	127	742
48	Addison, Mrs. A. L., Malvern .....	Rhode Island Red .....	100	576†
49	*Beer, A. C., Gilberton .....	" .....	—	—
50	Hill, H. V., West Adelaide .....	" .....	93	533
51	*Beer, A. C., Gilberton .....	" .....	—	—
52	Perkins, C. W., North Norwood .....	Silver Wyandotte .....	111	621
53	Addison, A. L., Malvern .....	White Wyandotte .....	111	451
54	Bagshaw, W. E., Hermitage .....	White Rocks .....	93	517
55	Bagshaw, W. E., Hermitage .....	Barred Rocks.....	101	453
Totals .....			1,115	5,025

\* Not in accordance with standard.

† One bird dead.

## COMMONWEALTH CLYDESDALE HORSE SOCIETY (S.A. BRANCH).

## REGISTRATION OF STOCK.

Breeders of Clydesdale stock who desire to have same registered in volume I. of the Stud Book, now in course of compilation, are reminded that official registration forms are now procurable from the Hon. Secretary (Mr. J. A. Riley), 23, Waymouth Street.

Although entries for this particular Stud Book closed on September 3rd last, the committee of the South Australian Branch has been successful in obtaining an extension of time up to November 30th next.

As all entries from South Australia have to be reviewed by the committee of the South Australian Branch, it will be necessary for all registrations to be lodged with Mr. Riley not later than November 25th, 1921.

In view of the importance of only having pure-bred stock, it is hoped, therefore, that breeders will lose no time in submitting their horses for registration, and by becoming members of the Branch.

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of October, 1921, also the average precipitation to the end of October, and the average annual rainfall.

Station.	For Oct., 1921.	To end Oct., 1921.	A'v'ge. to end Oct.	A'v'ge. Annual Rainfall	Station.	For Oct., 1921.	To end Oct., 1921.	A'v'ge. to end Oct.	A'v'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.					LOWER NORTH—continued.				
Oodnadatta .....	0.15	7.82	4.02	4.73	Spalding .....	1.10	20.50	17.81	20.18
Marree .....	0.19	4.98	4.92	6.02	Gulnare .....	1.20	18.92	16.97	18.97
Farina .....	0.18	5.78	5.52	6.57	Yacka .....	0.94	17.66	13.65	15.27
Copley .....	0.07	8.04	7.04	8.30	Koolunga .....	0.91	17.82	14.05	15.73
Beltna .....	0.06	8.79	7.47	8.93	Snowtown .....	1.28	19.77	14.43	15.87
Blinman .....	0.31	10.58	10.78	12.52	Brinkworth .....	0.97	16.48	14.53	15.91
Tarcoola .....	0.14	13.10	6.43	7.33	Blyth .....	1.61	20.89	14.95	16.55
Hookina .....	0.90	17.86	10.83	12.65	Clare .....	1.87	26.36	22.12	24.47
Hawker .....	1.06	20.19	10.70	12.37	Mintaro .....	0.95	22.95	20.97	23.07
Wilson .....	0.78	19.54	10.49	11.85	Watervale .....	2.15	25.57	21.43	27.48
Gordon .....	0.93	23.30	9.13	10.43	Auburn .....	1.96	24.83	21.74	17.82
Quorn .....	0.72	22.84	12.31	13.79	Hoyleton .....	1.22	18.73	15.81	15.82
Port Augusta .....	0.26	17.52	8.26	9.42	Balaklava .....	1.33	16.82	14.06	13.14
Port Augusta West .....	0.28	17.35	9.26	9.36	Port Wakefield ..	1.46	17.30	11.86	13.54
Bruce .....	0.35	17.95	8.04	9.99	Terowie .....	0.47	16.88	11.65	13.97
Hammond .....	0.46	25.89	10.02	11.36	Yarcowie .....	0.47	18.22	12.25	13.54
Wilmington .....	0.82	18.32	16.12	18.06	Hallett .....	0.82	18.55	14.28	16.28
Willowie .....	0.67	26.68	12.53	11.82	Mount Bryan .....	1.27	19.99	14.47	16.38
Melrose .....	1.44	22.00	20.91	23.11	Burra .....	1.54	21.35	16.12	17.91
Booleroo Centre .....	0.55	19.41	13.62	15.51	Farrell's Flat .....	1.16	20.35	16.94	18.87
Port Germein .....	0.60	20.93	10.99	12.65	WEST OF MURRAY RANGE.				
Wirrabara .....	1.64	20.72	17.44	19.44	Manoora .....	1.59	19.95	16.55	18.54
Appila .....	0.66	22.39	12.41	14.90	Saddleworth .....	1.70	19.37	17.54	19.75
Cradock .....	1.24	19.97	9.55	10.82	Marrabel .....	1.60	20.94	17.46	19.44
Carrieton .....	0.77	22.83	10.81	12.34	Riverton .....	1.86	19.42	19.49	20.74
Johnburg .....	0.68	17.98	8.91	10.22	Tarlee .....	1.85	17.06	15.66	17.86
Eurelia .....	0.62	21.39	11.50	13.11	Stockport .....	1.78	18.71	14.45	16.36
Orroroo .....	0.70	20.35	11.70	13.42	Hamley Bridge .....	1.47	16.70	14.59	16.52
Nackara .....	0.32	19.16	9.70	10.63	Kapunda .....	2.11	18.87	17.71	19.85
Black Rock .....	0.71	15.36	10.79	12.29	Freeling .....	2.20	16.49	15.83	17.95
Ucoita .....	0.20	14.25	10.28	11.65	Greenock .....	2.35	19.03	19.17	21.73
Peterborough .....	0.68	15.71	11.44	13.82	Truro .....	2.30	22.23	17.95	20.18
Yongala .....	0.67	17.22	12.38	14.13	Stockwell .....	2.01	19.15	17.96	20.40
LOWER NORTH-EAST.					Nuriootpa .....	2.12	20.45	18.67	21.09
Yunta .....	0.12	14.26	7.29	8.50	Angaston .....	2.10	21.23	19.62	22.33
Waukaringa .....	0.68	11.98	7.02	8.14	Tanunda .....	2.72	20.77	19.91	22.54
Mannahill .....	0.30	16.35	7.09	8.51	Lyndoch .....	2.42	21.87	20.58	22.81
Cookburn .....	0.45	—	—	8.03	Williamstown .....	2.07	22.27	26.02	27.74
Broken Hill, N.S.W.	0.71	14.28	8.50	9.98	ADELAIDE PLAINS.				
LOWER NORTH.					Mallala .....	1.78	17.38	14.91	16.61
Port Pirie .....	0.83	19.34	12.46	13.26	Roseworthy .....	1.58	15.41	15.41	17.37
Port Broughton ..	0.74	16.90	12.75	14.13	Gawler .....	1.79	16.90	16.73	19.14
Bute .....	1.58	18.73	14.18	15.55	Two Wells .....	1.51	13.61	14.22	15.91
Laura .....	1.58	21.03	16.13	18.12	Virginia .....	1.30	14.46	15.49	17.11
Caltowie .....	1.13	20.89	14.99	17.02	Smithfield .....	1.38	14.44	15.19	17.33
Jamestown .....	1.33	20.86	15.52	17.56	Salisbury .....	1.28	14.50	16.67	18.52
Bundaleer W. Wks.	1.33	20.17	15.55	17.56	North Adelaide ..	1.79	23.63	19.67	21.87
Gladstone .....	1.22	19.16	14.16	16.05	Adelaide .....	1.81	19.94	18.89	21.01
Crystal Brook .....	1.21	21.20	13.93	15.62	Glenelg .....	1.35	15.79	16.57	18.42
Georgetown .....	1.69	20.15	16.29	18.30	Brighton .....	1.69	20.45	19.05	21.03
Narridy .....	0.81	15.50	14.62	16.43	Mitcham .....	2.61	23.12	21.73	23.68
Redhill .....	1.06	21.99	15.04	16.66	Glen Osmond .....	2.11	22.78	24.38	25.73
					Magill .....	2.07	20.21	22.75	25.38

## RAINFALL—continued.

Station.	For Oct., 1921.	To end Oct., 1921.	Average to end Oct.	Average Annual Rainfall
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## MOUNT LOFTY RANGES.

Teatree Gully.....	1-99	20-91	24-91	27-73
Stirling West .....	3-88	38-78	42-72	46-82
Uraidla .....	3-66	33-48	40-40	44-49
Clarendon .....	3-03	29-64	30-16	33-18
Morphett Vale .....	1-79	20-68	20-51	22-80
Noarlunga .....	1-97	19-71	18-46	20-21
Willunga .....	1-85	24-06	20-70	25-82
Aldinga .....	1-73	19-46	18-40	20-22
Myponga.....	1-81	25-49	—	—
Normanville .....	1-77	25-64	18-77	20-53
Yankalilla.....	1-74	22-98	23-15	22-93
Mount Pleasant ..	2-99	30-00	24-70	27-01
Birdwood .....	2-52	26-55	25-74	29-43
Gumeracha .....	2-83	30-62	30-30	33-33
Millbrook Rsvr. ..	2-80	29-78	—	—
Twedvale .....	2-44	31-30	32-69	35-60
Woodside .....	2-97	29-60	29-38	32-05
Ambleside.....	2-92	31-17	31-50	34-81
Nairne .....	2-11	23-79	25-95	28-58
Mount Barker .....	2-69	29-27	27-46	31-10
Ehunga .....	2-68	29-66	30-16	32-94
Macclesfield .....	1-90	25-50	27-75	30-60
Meadows .....	2-83	31-13	33-80	36-26
Strathalbyn .....	1-73	19-02	17-42	19-28

## MURRAY FLATS AND VALLEY.

Meningie .....	1-42	20-26	16-77	18-77
Milang .....	1-32	12-26	13-82	15-56
Langhorne's Bdge.	1-47	15-49	12-85	14-59
Wellington .....	1-36	15-92	12-91	14-82
Tailm Bend .....	1-40	16-66	11-25	24-55
Murray Bridge ..	0-57	14-50	12-17	13-98
Callington .....	1-19	15-56	13-74	15-45
Mannum .....	0-63	14-81	10-27	11-51
Palmer .....	1-07	17-44	13-55	15-23
Sedan .....	0-96	16-92	10-82	12-07
Swan Reach .....	0-80	16-94	9-30	10-80
Blanchetown .....	0-22	10-41	8-80	10-26
Eudunda .....	1-17	17-22	15-43	17-51
Sutherlands .....	0-88	14-71	10-35	10-90
Morgan .....	0-47	13-40	7-71	9-13
Waikerie .....	0-69	12-27	8-08	9-41
Overland Corner ..	0-40	9-88	9-36	11-11
Loxton .....	0-36	11-37	10-64	12-27
Renmark .....	0-46	12-11	9-30	10-92

## WEST OF SPENCER'S GULF.

Eula.....	0-51	6-88	9-89	10-03
White Well .....	0-19	—	7-81	9-24
Fowler's Bay .....	0-82	10-16	11-29	12-11
Penong .....	0-94	15-25	11-28	12-26
Murat Bay .....	0-95	9-84	9-07	10-47
Smoky Bay .....	0-69	10-51	9-57	10-37
Petina .....	1-12	12-63	11-84	12-97
Streaky Bay .....	1-22	13-08	14-06	15-09
Talia .....	1-25	14-57	14-05	15-35
Port Elliot .....	1-47	14-68	15-40	16-37
Cummins .....	0-82	17-03	—	—
Port Lincoln .....	1-05	14-87	18-25	19-83

Station.	For Oct., 1921.	To end Oct., 1921.	Average to end Oct.	Average Annual Rainfall
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## WEST OF SPENCER'S GULF—continued.

Tumby .....	0-79	16-34	12-99	14-76
Carrow .....	1-02	15-61	12-67	15-14
Arno Bay .....	1-25	16-89	11-70	13-10
Cleve .....	1-13	19-46	—	14-46
Cowell .....	0-76	10-85	10-33	11-56
Point Lowly .....	0-63	21-64	10-32	11-84
Kimba .....	0-78	—	—	—
Minippa .....	1-25	—	—	—

## YORKE PENINSULA.

Walleroo .....	0-79	18-64	12-81	14-11
Kadina .....	0-99	20-03	14-58	15-93
Moonta .....	0-75	18-39	13-92	15-93
Green's Plains .....	1-21	18-72	14-40	15-75
Maitland .....	1-63	22-02	18-30	20-20
Ardrossan .....	0-98	18-86	12-67	13-96
Port Victoria .....	1-69	17-82	13-95	15-34
Curramulka .....	1-78	16-69	16-70	18-31
Minlaton .....	1-55	19-17	16-29	17-70
Brentwood .....	1-53	18-99	16-94	15-44
Stansbury .....	1-37	17-73	15-33	17-08
Warooka .....	1-75	20-55	16-36	17-74
Yorketown .....	1-22	16-96	15-77	17-29
Edithburgh .....	1-22	16-04	15-02	16-58

## SOUTH AND SOUTH-EAST.

Cape Borda .....	2-01	26-38	23-13	24-96
Kingscote .....	1-99	19-67	17-40	18-92
Penneshaw .....	1-82	19-68	17-03	21-39
Victor Harbor .....	1-61	19-00	19-48	21-56
Port Elliot .....	1-98	19-72	18-09	20-00
Goolwa .....	1-48	18-10	16-12	17-87
Meribah .....	0-56	10-78	—	—
Mindarie .....	1-35	11-19	—	—
Karoonda .....	1-56	18-77	—	—
Pinnaroo .....	0-99	19-00	13-21	15-57
Parilla .....	0-94	15-73	13-40	14-02
Lameroo .....	1-47	16-61	13-16	16-45
Parrakie .....	1-51	14-59	12-51	14-42
Geranium .....	1-69	16-44	14-07	16-24
Peake .....	2-62	16-75	14-01	16-25
Cooke's Plains .....	1-87	17-40	13-19	15-00
Coomandook .....	1-73	19-59	15-42	17-75
Coonalpyn .....	1-30	14-26	14-51	17-64
Tintinara .....	1-38	15-20	16-33	18-83
Keith .....	1-19	16-25	14-91	18-54
Bordertown .....	1-15	15-72	17-12	19-52
Wolsley .....	1-15	16-23	16-09	18-07
Frances .....	1-20	15-74	17-36	20-16
Naracoorte .....	1-63	21-20	19-88	22-53
Penola .....	1-50	18-90	23-49	26-48
Lucindale .....	1-63	—	20-63	22-93
Kingston .....	1-97	—	19-38	24-51
Robe .....	1-61	—	22-51	24-60
Beachport .....	1-04	18-28	25-01	27-29
Millicent .....	2-02	24-88	26-85	29-29
Kalangadoo .....	2-11	24-75	—	—
Mount Gambier ..	1-69	20-33	27-46	31-65



## AGRICULTURAL BUREAU REPORTS.

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Angaston .....	*	—	—	Gawler River .....	*	14	12
Appila-Yarrowie ....	*	—	—	Georgetown .....	*	12	—
Arthurton .....	*	—	—	Geranium .....	+	26	—
Ashbourne .....	376	—	—	Gladstone .....	343	12	10
Balaklava .....	†	12	10	Glencoe .....	377	—	—
Bahannah .....	376	11	9	Glossop .....	369	9	14
Barmra .....	†	15	13	Gorda .....	360	16	—
Beetaloo Valley ....	340	9	—	Green Patch .....	*	—	—
Belalie North .....	*	12	—	Gumeracha .....	370	14	12
Berri .....	*	16	14	Halidon .....	*	—	—
Big Swamp .....	—	—	—	Hartley .....	370-77	9	14
Blackheath .....	369	12	10	Hawker .....	339	15	13
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Booleroo Centre ....	*	11	9	Ironbank .....	377	12	10
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Bowhill .....	*	—	—	Kadina .....	356	—	—
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Brinkley .....	369	12	10	Kanmantoo .....	*	12	10
Bundaleer Springs ..	*	—	—	Keith .....	*	—	—
Burra .....	*	—	—	Ki Ki .....	*	—	—
Bute .....	*	—	—	Kilkerran .....	†	10	15
Butler .....	358	—	—	Kimba .....	*	—	—
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Caltowie .....	*	—	—	Kingston-on-Murray.	†	—	—
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Claypan Bore .....	361	16	14	Laura .....	346	—	—
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Coomandook .....	*	25	30	Lone Gum .....	363	9	14
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Miltalie .....	†	12	10	Roberts and Verran ..	†	14	—
Mindarie .....	*	7	—	Rockwood .....	375	14	12
Minlaton .....	*	11	—	Rosedale .....	351	16	—
Minnipa .....	*	9	14	Rosy Pine .....	366	—	—
Mintaro .....	346	12	10	Saddleworth .....	*	—	—
Monarto South .....	*	—	—	Saddleworth (Women's)	*	—	—
Moonta .....	*	12	9	Salisbury .....	355-6	1	2
Moorak .....	†	10	16	Salt Creek .....	360	—	—
Moorlands .....	*	—	—	Sandalwood .....	*	—	—
Moorook .....	*	—	—	Shoal Bay .....	†	—	—
Morchard .....	340	12	10	Smoky Bay .....	†	12	10
Morgan .....	*	—	—	Spalding .....	*	—	—
Morphett Vale .....	377	17	16	Stockport .....	*	—	—
Mount Barker .....	373	9	14	Strathalbyn .....	*	16	13
Mount Bryan .....	†	—	—	Talia .....	360	14	12
Mount Byran East ..	†	—	—	Tantanoola .....	379	12	10
Mount Compass .....	*	—	—	Taplan .....	369	19	17
Mount Gambier .....	378	12	10	Tarcowie .....	†	15	13
Mount Hope .....	*	12	10	Tatiara .....	†	19	17
Mount Pleasant .....	*	—	—	Two Wells .....	*	—	—
Mount Remarkable ..	*	—	—	Uraidla & Summertown	*	7	5
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Mundoorra .....	*	14	12	Virginia .....	352-3	—	—
Murray Bridge .....	*	—	—	Walkerie .....	†	—	—
Mypolonga .....	*	9	14	Wall .....	*	—	—
Myponga .....	*	—	—	Wanbi .....	*	—	—
Nantawarra .....	355	10	—	Warcowie .....	*	—	—
Naracoorte .....	378	—	—	Watervale .....	354	—	—
Narridy .....	*	12	17	White-Yarcowie .....	*	—	—
Narrung .....	*	12	17	Wilkawatt .....	369	12	10
Neeta .....	*	—	—	Williamstown .....	356	2	7
Netherton .....	*	11	9	Williamstown (Women's)	†	11	9
North Booborowie ..	346	—	—	Willowie .....	†	10	—
North Bundaleer .....	*	—	—	Wilmington .....	*	19	14
Northfield .....	*	9	—	Windsor .....	356	14	—
Nunkei and Yurgo ..	*	6	4	Winkie .....	366	—	—
O'Loughlin .....	*	9	—	Wirrabara .....	*	5	17
Orroroo .....	†	—	—	Wirrega .....	*	—	—
Parilla .....	*	—	—	Wolowa .....	*	—	—
Parilla Well .....	369	14	—	Wudinna .....	*	—	—
Parrakie .....	*	—	—	Wynarka .....	369	12	—
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Penola .....	379	5	3	Yadnarie .....	360	16	13
Petina .....	*	26	—	Yallunda .....	*	—	—
Pine Forest .....	*	15	—	Yaninee .....	360	—	—
Pinnaroo .....	*	3	—	Yeeelanna .....	†	12	10
Pompoota .....	369	—	—	Yongala Vale .....	*	11	9
Port Broughton .....	*	11	9	Yorkstown .....	*	—	—
Port Elliot .....	*	19	17	Younghusband .....	†	17	15
Port Germein .....	*	19	17				
Ramco .....	*	14	12				
Redhill .....	†	—	—				

\* No report received during the month of October.

† Held over until next month.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

HAWKER (Average annual rainfall, 12.22in.).

September 6th.—Present: 10 members.

**CARE OF THE FARMING PLANT.**—The monthly meeting of the Branch was held at Mr. C. Pumpa's residence. The Hon. Secretary (Mr. J. Smith), read a paper on this subject. He said it was evident that the price of wheat was on the down grade, and wool-growing at the present prices was not remunerative, so that those two important features of the farmer's income rendered it imperative that the cost of production should be cut down, and there was no doubt that a considerable saving could be effected by the farmers if they took proper care of the farming plant. Harness was an expensive essential in the working of a farm, and, if not taken full care of, would increase the working expenses of the holding. The dressing of the leather with neatsfoot oil once or twice during the year and the keeping of the harness under cover would lengthen its life very considerably. Collars that received rough treatment invariably resulted in the horses contracting sore shoulders, and on that account alone farmers would be well advised to take better care of them. He believed the erection of a harness room would more than repay its cost in the amount of money that would be saved by the care of the leather. The iron implements, such as the plough, harrows, cultivators, &c., did not require a great deal of attention other than an occasional overhauling to see that all the nuts and bolts were kept securely fastened. The other implements, including the wagon, drays, and light vehicles, should be kept under cover when not in use. If the woodwork of the machines was given a coat of paint once in 12 months one would do much towards extending their life of usefulness. It was decided to hold a series of "Homestead meetings" in the hope that a keener interest would be taken in the work of the Branch.

HOOKINA (Average annual rainfall, 12in.).

September 15th.—Present: 10 members and five visitors.

**BLOWFLY DESTRUCTION.**—Mr. S. W. Scriven, who read a paper dealing with this subject, said every sheepowner knew to his cost that the hairy maggot that infested the wool and carcasses of the sheep during the hot months of the year came from the species of blowfly that was distinguished by its deep-blue metallic color. Trapping in the hands of careful and consistent men was an excellent method of combating the pests. The destruction of dead carcasses of animals should be carried out simultaneously as far as possible with the trapping, otherwise the flies would breed more quickly than they could be trapped. The trapping should be carried on throughout the year, and would prove most effective in sheepyards, places where the sheep were in the habit of camping, watering places, and in patches of scrub and saltbush. The following description of the construction of the trap was then given by the writer:—"One of the ends of a kerosine tin is removed and the opening covered with a piece of wire gauze, which should be allowed to overlap the edges of the tin around which it is bent. Let into the

gauze is a funnel about 4in. in diameter and 5in. deep, the opening at the apex being about the size of a threepenny piece. It is advisable to paint the inside of the tin with cold water paint, and if the outside of the tin is also treated in a like manner, it will considerably lengthen the life of the trap. For a bait, any kind of offal can be used, the heart, liver, and lungs of a sheep to be preferred. The trap should be placed in an upright position." In the discussion that followed, Mr. J. Murphy did not think the trapping could be done with very much success on large holdings. Mr. J. O'Connor said all the ewes should be crutched before lambing time and attended to every week so that the blowfly would not get the sheep in a bad condition. Mr. A. I. Heneschke favored destroying all carcasses. All affected sheep should be crutched and treated with sheep dip, and then put in a small paddock away from the main flock until they were quite well again. One sheep badly affected with maggots would soon have reared enough blowflies to damage the whole flock. Mr. B. Murphy thought traps as described by the writer could be worked with great success about the sheep camps and yards, also in stables or clumps of scrub. The blowfly trouble made it very important for the sheepowner to keep plain-bodied sheep. He had often seen wrinkly wethers collect grass seeds around the eyes and in the wrinkles till they pierced the skin, when they became badly blown.

MORCHARD, September 10th.—Mr. R. B. Gregory, the representative of the Branch at the Roseworthy Winter School for farmers, brought forward a paper on the address and lectures given at the school. A good discussion followed. Members were of the opinion that the school should be held again next year, as much useful information was obtained.

## MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 23.50 in.).

September 14th.—Present: 10 members and visitors.

CURRENT DRYING.—In the course of a short paper dealing with this subject Mr. J. Fradd said the fruit should reach a good rich color with a sweet flavor before being picked. When picked it should be taken to the drying ground, which could with advantage be a small plot of lucerne land. That would help keep down the dust, which was so prevalent during the drying season. Owing to the high cost of drying trays the berries could at first be placed on wire netting stretched on posts with wire on each side and one down the centre. The centre post should be 18in. higher than the outside posts, with wire running along the top. This enabled easy covering if it was deemed necessary. Hessian or some such material should be placed on the ground to catch the berries as they dropped off. An occasional shake would be found necessary to help remove the berries. After a while the fruit could be placed on the trays to complete drying. The fruit could be turned by placing an empty tray over the loaded one and, gripping both firmly, turn them swiftly upside down, thus reversing their positions and leaving the fruit on the erstwhile empty tray. Care should be taken not to include any large berries with seeds, as those would spoil the sample. The fruit should not be overdried. Stacking could be carried out to complete the drying when the berries had reached that stage at which no watery fluid would exude if they were rolled in the hands. When the fruit was finished drying it could be put through a couple of fine hand sieves to rub out any dry stalks. That would also bring out most of the small berries. When properly cleaned and graded the fruit was put up in bulk and allowed to sweat. That allowed any over-dried fruit to take moisture from any that was under dried. The fruit could then be put in strong calico bags to keep it free from the larvae of the fruit moth until such times as it was thought advisable to dispose of it.



## Two Sickly Pigs Made Healthy and Fat by Using Karswood Pig Powders.

"Give pigs Karswood Pig Powders and watch them grow," is a tip worth taking. Karswood Pig Powders not only quickly help healthy pigs to market in fine, fat condition but they put sickly stunted pigs on their feet, help sows when farrowing, and take all the risk out of pig raising.

"55, Franklin Road, Bourneville,  
Birmingham, England.

I have two pigs that were stunted when very young, and people told me I should never do any good with them, and they certainly did not grow very fast. I saw your advertisement, so I sent for a packet of a dozen Karswood Pig Powders, and I won't say they put on 18lbs. but they certainly put on 18s. The man I bought them from saw them this morning, the first time for about a month, and he would not believe they were the same pigs. He asked me what I had been giving them, and I told him Karswood Pig Powders; so he gave me the money to get some for him.

A. LAINCHURY.

September 17th, 1918."

REALISES £127 FOR HIS PIGS IN  
NINE MONTHS.

"Dairy Ayrshire, England.

I must let you know the great value in Karswood Pig Powders. I went out in search of a pair of pigs, and good ones at that; but I could not get them. I came across five pigs—poor, dying-looking things, so I took two of them at £3 each, because I knew what Karswood Pig Powders could do. I gave them Karswood Pig Powders, which brought them round about three weeks after, and by the middle of July we sold them for over £27. From March 17th until July 25th, 1919, I bought eight pigs, costing £27 10s., and by Christmas had them sold for a good bit over £100. They all had Karswood Pig Powders twice weekly, and they could eat greedily after they got Karswood.

March 23rd, 1920." JOSEPH MORGAN.

### SIZES AND PRICES—

Karswood Pig Powders are sold by Australian dealers at **1s. 4d.** per packet of 12 powders (with a valuable booklet on pigs, illustrated, in each packet). If your local storekeeper or produce dealer does not supply, write to the Wholesale Agent (see address below) who will send you the address of a dealer who does sell them, and see that you are supplied.

AGENTS FOR SOUTH AUSTRALIA—

**SOUTH AUSTRALIAN MILLING & TRADING Co., Ltd.,**

BAKER STREET, PORT ADELAIDE.

*NOTE—Karswood Pig Powders are Made in Manchester, England, by E. Griffiths Hughes, Ltd., established 1756, in the reign of George the Second.*

**BREAKING UP NEW LAND.**—Mr. M. J. Casey, who contributed a paper dealing with this subject, said in the Beetaloo district, where one had to contend with stones, stumps, porcupine, yaccas, &c., early consideration should be given to the plant for working the land. For that purpose it was necessary to have a good strong three-furrow plough and six strong steady horses. If the ground was intended for fallow he thought it a good plan to plough to a depth of 5in. or 6in. to raise as many stones, roots, &c., to the surface as possible. As most new ground had a tendency to sourness when first broken up it should be freely cultivated, especially with the harrow, as that tended to sweeten the ground. If the new ground was broken up just prior to seeding he would not plough it so deeply, as the soil was then not so sour or cold. Oats he considered the best cereal to sow for the first crop, as they sweetened the ground and helped to prevent the spread of take-all to a great extent. If one could secure a good burn before fallowing, and if time permitted one to pick up all surface stones, stumps, &c., the problem of breaking up new land would be made much easier. In the discussion that followed members did not favor breaking up new land to a depth of 6in. for that district. It was also considered a better practice to sow the virgin soil with wheat in preference to oats.

**BLYTH** (Average annual rainfall, 16.46in.).

August 31st.—Present: 15 members and one visitor.

**HOMESTEAD MEETING.**—Members congregated at Mr. Eimes' farm in the afternoon at 2 p.m., and inspected the four paddocks of wheat crop sown under varied conditions, and different varieties of wheat. On returning to the homestead, the remainder of the afternoon was first spent inspecting farm improvements, including an electrical installation from which demonstrations were given of an electrically-driven washing machine, wringer, and a sewing machine. An extension of the installation provides lighting in the cowsheds, stable, and chaffsheds. A new Swedish Diesel type crude oil engine was also set in motion to demonstrate the achievement in construction of that type of engine. Tea was provided by the ladies.

**ROAD-MAKING.**—The meeting was continued when Mr. A. L. McEwin read a paper on the above subject. Road construction, he said, was a matter that every district council should study, and each local body should have a grader, a road scarifier, and a plough, and conjointly own a stone crushing plant. The formation or foundation of the work should be formed 12 months ahead of the laying down of the metal so that it would become consolidated. The material should be of the best obtainable and the crown so formed that it would turn all water off the road. He was of the opinion that more damage was done to the roads by water than by traffic. In road construction the most important matter to consider was the provision of culverts, watertables, and side drains for the drainage. Where it was not practicable to lay down pipes, a wide watertable, with a rise of one in 15, should be provided. He firmly believed that no matter where metal was laid down it would pay handsomely to keep the side tracks in good order. If that was done the tracks would carry more than three-quarters of the traffic, which meant that the metal would only be used in wet weather and by the heavy loads. It was a great mistake to allow water to run along the side of the metal. Wherever possible, proper provision should be made for adequate drainage facilities. The metal that bound and made the road impervious to water was the most economic for road construction purposes. On the district roads a good coat of blinding should be laid down and given a light rolling, and the life of the roads would be considerably lengthened if a few shovelfuls of metal were placed in the ruts as the road showed signs of wearing.

**QUESTION BOX.**—A further meeting was held on October 1st when 22 members and six visitors attended. The meeting took the form of a "Question Box." The first question, "Is it Profitable to Fallow Deeper than 3in. for Wheat Growing?" was in the hands of Mr. J. Drennan, who thought deeper fallowing would pay to the extent of 5bush. heavier yield on 5in. ploughing against 3in., but the area of ground that could be worked would only be 200 acres against 360 with the same strength. The cost of working would be double, and, therefore, it would not pay on large holdings. On smaller holdings he favored deep ploughing. In the discussion that followed, no members were prepared to follow the argument of deep ploughing and the increase in yield, excepting in the event of a very wet

year when it was generally contended that shallow ploughing would yield better results than deep cultivation. In reply to the question "Which is the Better Cultivator to Use, Spring Tooth or Ordinary?" Mr. Herman Zweck expressed a preference for the spring tooth implement. In the first place, the farmer was able to cover more ground in the same time than with the ordinary cultivator, and only the same number of horses was required for each machine. By using the spring tooth cultivator the work could be finished earlier in the season and that forced an early germination of weed seeds so that a second cultivation, which destroyed a large number of weeds, was possible. That saving of time was due to the fact that the spring tooth cultivator cut a strip of land 3ft. wider than the ordinary implement. Another point in favor of the former implement was the fact that it made a thoroughly good job of destroying the weeds. He believed that a good deal of the prejudice that was held against the spring tooth cultivator was due to the fact that those who abused the machine did not use the right size of shares. When the machine was received from the factory it was fitted with 4in. shares, and, if worked in a paddock overrun with weeds, it would not do good work. If shares cutting 6in. were substituted for those shares, no complaint would be found with the work done by the spring tooth cultivator. In the discussion that followed, users of spring tooth cultivators did not favor the use of 6in. shares. They believed the best results were received from the 3in. and 4in. shares. While the advantages of the spring tooth were generally acknowledged, many found that the heavier cultivator could not be dispensed with in cases of advanced weed growth and heavy land in wet weather. Where the conditions were suitable there was no rival to the spring tooth implement for expeditious and efficient working. Mr. A. J. Ninnies in dealing with the question "Best Way to Clear Melons off Fallows?" said he was fortunate in not having melons on his land, and he thought if members did not allow the plants to seed they would not be troubled with the melons on the fallow. In the discussion that followed, it was not admitted that the predominance of melons was due to neglect. The melons seemed to come up at once and smother the fallow. Sheep were acknowledged as carriers of the seed, but it was admitted that they checked the growth of the plants on the fallow. Some members had cultivated and used the hoe afterwards. Others, who were unable to deal with them in that way, considered the disc cultivator an implement that cut the melons up sufficiently to need no further labor spent on them. Some speakers considered that, if possible, the teams should be worked during harvest when the menace could be controlled and even prevented.

#### GLADSTONE (Average annual rainfall, 16in.).

September 10th.—Present: Seven members and four visitors.

The Hon. Secretary (Mr. F. Pitman) read short articles on "Sore Shoulders on Horses" and "Stinkwort as a Soil Improver." The papers received short criticism. Mr. C. Hollitt said that in France and Belgium horses wore a wooden combination of collar and hames, and while over there he had never seen a horse with sore shoulders. Members expressed doubtful opinions as to stinkwort being a soil improver. They considered it more of a curse than a blessing.

#### YACKA.

August 16th.—Present: 27 members.

**TROUBLESOME WEEDS AND THEIR CONTROL.**—"In dealing with the subject, my object is as far as possible, to give my experience with weeds which have come under my notice and the methods of controlling and keeping wheat crops comparatively free from them," said the Hon. Secretary (Mr. H. O. Badman) in a paper under the above heading. Continuing the speaker said the most prevalent weeds of winter growth which were detrimental to wheat crops were:—Black oats, Cape weed, Oriental rocket, saffron thistle, wild turnip, soapwort, and corn gromwell. They could fortunately be checked a great deal by cultivation of the fallow, both immediately after fallowing and at seeding time. Black oats, although troublesome in crops, made good pasturage, and the stock carrying capacity of the farms was largely supplemented by it. During average winters it did little

or no damage to the wheat, but in abnormally wet winters, several germinations took place with the result that even after the wheat had shown above ground, a lot of oats germinated and the wheat eventually suffered, both by losing plant food and having the heads whipped off by the oat ears. Where Black oats were destructive in a crop he advised cropping the stubble land with barley or Algerian oats. Cape weed, commonly called "Dandelion," favored the lighter soils and did not appear to thrive in heavy chocolate loam. It was not much good for pasture, but stock would fatten on it if the plants made sufficient growth to enable them to get a mouthful. Land infested with Cape weed was best harrowed immediately after ploughing, and then cultivated a week or so after the first autumnal rains. If left until three or four inches in diameter the plants were extremely difficult to destroy. Oriental rocket preferred limestone soil, and if not killed at seeding time had a most disastrous effect on the crop. On well worked fallow it germinated readily with the first autumn rains, and could easily be killed by shallow cultivation. It was not advisable to sow wheat until a second germination of the weed had taken place. Stock would eat it but they did not care very much for it. Saffron thistle, sometimes erroneously termed "Star thistle," was not good for stock. It grew with the early rains and could be controlled by cultivation. Land infested with it should be thickly sown with wheat, say, 15lbs. or 20lbs. per acre above the normal seeding. This would crowd the thistle out and it would not grow to such a height as to be a nuisance during harvesting operations. Wild turnip in some districts was a curse, and a lot of hard work was required to eradicate it. Land infested with that weed should be cultivated to a fine tilth to secure a good germination. After the first germination the soil should be worked again and the wheat drilled in very thickly. Barley would act as a deterrent and help to crowd out the turnip. Soapwort, sometimes called in the vernacular "Nancy" or "Nanny-weed" did not germinate until the seeds were well soaked with the moisture, therefore, as in the case of turnip, the land should not be sown until late in the season. Corn gromwell, or "Sheep-weed," like "Oriental rocket" preferred loamy and limestone soils. It could easily be killed by cultivation and did not do much damage to crops, unless the wheat was sown before the autumn rains, when it often overran the wheat crops. The most troublesome of the summer weeds were stinkwort, paddy-melon, potato-weed, and squash wild melon. Usually the seeds did not germinate until the spring working of the fallows was completed, or at the beginning of harvest, just when the farmer required all hands for haymaking. Stinkwort usually germinated in September and October, and, under usual cultivating methods, could be killed on the fallow. Of all the weeds that grew in their district he believed it to be the greatest curse. It was most injurious to stock, and most farmers had at one time or another lost a good number of sheep through the animals eating the plants. The plants were a great hindrance on the land during ploughing, cultivating, and drilling, and the disc cultivator was the only implement that would deal with stinkwort satisfactorily. If it was not convenient to cultivate the fallow during hay time, and the stinkwort showed up to any extent, the best plan was to use the disc cultivator as soon as possible after harvest. Allow the weeds to lie until they became thoroughly dry and then run the harrows over the land until the plants were broken up. Paddy-melons did not appear very early in the summer, and the best method he had found for cleaning them off the fallow was to run the heaviest harrows procurable over them to drag out the vines. After that they could be left until dry, and the harrows again used to break them up. Squash melon.—The same treatment as applied to paddy-melon would clear that weed from the fallow. The stock would not eat "Potato-weed" or "Potato-plant," but fortunately it was easily broken up with the harrows and could be cleared without disc cultivation. The artichoke, although seeding annually, was a perennial at root, and if left would quickly overrun the rich low lying lands. Grubbing was of no use if the tap root was left in the ground. The best method of eradication was to chop off the tap root about three or four inches below the surface and apply a pinch of salt-petre. Another weed that was making its appearance in the district was the sour sop, and he advised farmers to be careful and burn all fruit and rose tree packings as sour sops were frequently rolled up in the straw and hessian. In concluding the speaker urged that every farmer should exercise great care with any new plant that he discovered on his farm, because, if allowed to go unchecked, it might become a great curse to him and the surrounding country.



**YACKA.**

July 19th.—Present: 23 members and four visitors.

**HAY GROWING AND HAY MAKING.**—In a paper on this question, Mr. F. W. White said farmers often made a mistake of sowing three or four varieties of wheat which were recognised as the best grain yielders. Too frequently the hay was cut wherever the crop happened to be the heaviest or where some wild oats made their appearance. In doing that, one should be careful to cut that particular piece of crop when the wild oats were at their best, even if the wheat was a little too green, because the value of wheat cut rather prematurely for hay, was many times that of the wild oats allowed to partly dry off. Those farmers who kept a fair number of horses would not do wrong in sowing 15 to 20 acres with a solid straw variety, as the difference in the amount of nutriment contained in the solid straw varieties, and that of the ordinary hollow straw was very considerable. Also for a stack that was likely to stand for some years a solid straw variety would remain in a much better condition because mice did not do so much damage to it. By those farmers in this district who grow a small acreage, especially for hay, King's Early was most favored. All that could be said against it was that it did not grow to any great height, and during a very wet year it was somewhat inclined to lodge. A variety that he had known to prove very satisfactory was that locally known as "Giant Beardsy." As regards the stage at which to cut, he preferred binding when the crop was a little on the green side, that with oats added would make a better feed than the chaff from hay left until the corn was nearly ripe. If one made a practice of sowing from 20 to 30 acres of stubble land with oats each year, he would not likely be short of corn. Regarding preservation, he favored stooking close up to the binder; standing the first portion of the stook fairly erect and sloping the sheaves more as the remainder of the stook was built. If the outside formed an unbroken circle, it would take a very strong

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wind or rain to do much damage. As for the stacking; the keeping of the middle of the stack full was a very important point, and if that was done the hay would be practically safe, even under adverse weather conditions. For binding and roofing the stack he preferred to lay the heads outwards in order to secure a greater slope without fear of the sheaves slipping. For covering stacks he strongly recommended sheaved straw. In the discussion that ensued Messrs. Rundle and Harvey were of the opinion that such wheats as Le Huguenot and Kubanka were unsuitable for hay, as they were too hard and injured the digestion of the horses.

They also agreed that bearded varieties were not best for hay. The Hon. Secretary (Mr. O. Badman) stated that he had been searching for good hay varieties for several years and had conducted trials with that end in view. He now believed that the new wheats from Roseworthy Agricultural College—Rajah, Sultan, President, and Felix—were just the right kind for hay as they were solid in the straw, of the King's Early cross type, but without the objectionable beard. Mr. Abbott favored a mixture of King's Early and Zealand Blue. Oats added to those varieties he considered made a splendid feed for horses.

LAURA, September 18th.—Mr. F. T. Hughes delivered a short address dealing with the subject, "Value of Sudan Grass as Compared with Other Summer Fodders." In the discussion that followed the majority of members expressed a preference to lucerne as a summer fodder crop. Mr. Hughes was of the opinion that sorghum was to be preferred to lucerne when one was in a position to irrigate. A discussion also took place on the lucerne flea. Members thought the best plan to eradicate the pest was to cultivate the land in spring or give it a heavy harrowing, which would prevent the fleas from breeding. It was also advisable to keep the lucerne cut as close to the ground as was possible.

MINTARO, September 24th.—A full and detailed account of the proceedings of the Annual Congress was given by the delegates, and an interesting discussion followed.

NORTH BOOBOROWIE, September 28th.—The Government Veterinary Surgeon (Mr. C. A. Loxton, B.V.Sc.) gave a veterinary demonstration during the afternoon at the Booborowie Experimental Farm, and in the evening delivered a lecture on veterinary subjects of interest to stock owners.

## LOWER-NORTH DISTRICT.

### (ADELAIDE TO FARRELL'S FLAT.)

#### BLACK SPRINGS.

August 16th.—Present: 18 members.

LAMB TAILING.—In the course of a paper dealing with this subject, Mr. E. I'Anson expressed the opinion that 90 per cent. of the deaths of lambs that died from the effects of tailing were caused through tetanus. The disease was caused by a germ that was picked up from the soil, and was more prevalent in rich soil and about old yards and piggeries than on clean land. One usually noticed that the sheepyards on the majority of farms adjoined other stockyards, and were surrounded by an accumulation of old manure and rubbish. When the ewes were yarded and the lambs caught, operated on, and dropped over the fence, and allowed to lie down around the yard, which was very often a dung heap, there was every possibility of them picking up the germ. The lambs found their way back to the ewes, and were frequently knocked down in the dirt, whilst others were being caught, and even if they escaped the germ, the extra knocking about was likely to cause increased bleeding. His method, which had proved a success, was to draft the lambs off into a secure pen and turn the ewes into a paddock adjoining

the yards, then, as the lambs were put carefully on their feet after the operation, the ewes would run off with them, and so that when they laid down they would probably be on clean land.

**CARE OF FARM MACHINERY.**—Mr. E. Seigert, who contributed a paper on this subject, said every farmer should have a good shed in which to store his implements. If no doors were provided, the speaker preferred a well-thatched straw shed open to the east. When one had finished work with a machine for the season it should be taken to the blacksmith's shop and thoroughly overhauled. If any parts were worn out new ones should be put in their places. If all the nuts and bolts were tightened up, the thread of the bolts could rust a little through the winter, and they would then not be so likely to shake loose when in operation. It would also be a good plan if the woodwork was given a coat of paint every two or three years to preserve the life of the timber. With some machines it was necessary to exercise great care not to drive the horses too quickly over rough and stony ground. One frequently noticed that a man driving a cultivator tried to turn the implement at right angles without pulling back the lever. Such a practice, in a short time, would bend the tyres and wrench the cultivator to pieces.

**METHODS OF WORKING HORSES.**—At a further meeting, held on September 22nd, Mr. H. Hersey contributed a paper dealing with this subject. The writer said of the many different ways of working a team of horses, he preferred what was generally known as the "one yolk" system. The principle of the "one yolk" was to work the horses seven or eight hours without any feed at dinner time, thereby eliminating the time wasted by other methods in unharnessing the horses and in travelling to and fro from the stable. Such a practice would also enable the teamster to do odd jobs, of which there was always plenty on the farm. The most important advantage was that the horses were always in the stable before sunset and the sweat had dried on them before nightfall. He had observed horses taken into a stable after sunset wet with sweat, and they were in the same condition in the morning. That had a very bad effect on their constitution. Horses worked on "one yolk" did just as well (if not better) than those that were worked otherwise. Nothing was to be gained by working the team one way to-day and another way to-morrow. They should be worked in "one yolk" every day from the start of seeding and they would soon become accustomed to it. Of course, they could not be worked in that manner during harvest time as the days were too long, and it was not right that the team should go so long without water. He also favored working the horses abreast whenever it was possible. When worked in the manner of a tandem, one horse's power out of every ten was lost. Another disadvantage of the tandem team was in turning the corners. It took the horses twice as long to turn as the abreast team, and that was a big item, especially where short rounds were encountered. Horses worked abreast could be made to work quite evenly on the swing, whereas with the tandem team one horse very often did the work of two.

**CARE OF THE COLT AND ITS HOOF.**—In a short paper on this subject, Mr. S. Burbridge said when the foal was about a week old it should be caught and thoroughly handled so that at the age of three months one would be able to pick up and trim its hoofs. The toe and frog should be kept short, and if the operation was performed every three months, or whenever one noticed that the hoofs were becoming uncomfortably long, a better shaped hoof would result. It was the speaker's opinion that when the horses were being shod, one should be careful not to burn to the hoof as that made it very brittle.

## LONE PINE.

September 20th.—Present: 19 members and two visitors.

**ANTHRAENOSE OR BLACK SPOT OF THE VINE.**—The following paper was contributed by Mr. F. Basedow:—Anthraenose of the vine has been known for a great many years in Europe, and differs from oidium and downy mildew, these being introduced into the vineyards of Europe from America about 70 years ago. Anthraenose is a type of fungoid disease, the fungi being lowly organised forms of plant life. The disease can first be distinguished by the appearance of a small discolored spot on the young wood of the vine; this spot then increases in size, and may as time goes on become an open wound. The depressed centres of the

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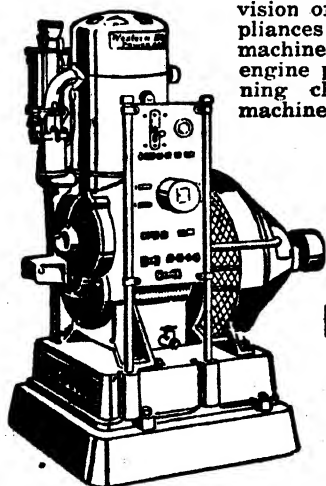
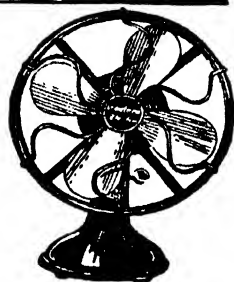
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scars are usually surrounded by a more or less swollen rim. It can in this way be distinguished from oidium or mildew, which leave markings that are discolored and sometimes rough, but never sunken in like anthracnose. A vine suffering from anthracnose has the young shoots stunted, the leaves become black, and the young bunches wither. The growing parts of the vine are marked with scars, which are swollen and black around the edges, the leaves are often punctured with holes of different size, and these holes are blackened around the rims. Anthracnose must have moisture to help it develop, and we therefore are most likely to find it appearing after a spring and early summer in which there have been frequent showers or heavy dew. In the case of oidium or downy mildew the wind carries the spores over long distances. With anthracnose or black spot the spread is by contact. Experience has shown that the only really effective cure for this disease is by swabbing the vine with a mixture of sulphate of iron 35lbs., sulphuric acid 4lbs., and hot water 10galls. The mixing should be done in a wooden tub or other receptacle which will withstand the action of the acid, which is corrosive. Put the crystals of sulphate of iron in the tub, pour on this the sulphuric acid, and then add the hot water, and stir until the crystals are dissolved. The best time to swab is as near as possible to the bursting of the buds in spring (about two weeks before the buds burst). One should not attempt swabbing if the buds are out, as this mixture would be injurious to the buds. Trellised vines should be swabbed before the rods are tied, as the solution eats into the wire. No ordinary pump will do for applying the mixture, as the sulphuric acid will corrode the metal parts. The best way is to use a whitewash brush which has no metal parts and is bound with string. All parts of the vine must be thoroughly saturated with the solution. Swab from the base of the vine to the extremities of the spurs and rods. It is a wise plan to give two swabbings at an interval of about two weeks. All prunings and cuttings, &c., of the vine affected must be burned on the spot. Spraying with a copper solution after the buds have burst will prevent the germination of the spores of black spot. Sultanas are most easily affected. Muscatel, Doradilla, Carbenet, Riesling, Carignanc, and Sweet-water are also liable to suffer from anthracnose or black spot. Shiraz and Mataro have the best chance against this disease.

MALLALA (Average annual rainfall, 16.88in.).  
September 5th.—Present: 15 members.

THE IMPORTANCE OF EDUCATION.—In the course of an address on this subject the Hon. W. Hannaford, M.L.C., drew attention to the fact that children finished their education with the primary school, with the result that after leaving that institution they took up the first occupation that came to hand. The great need of the State is trained artisans and mechanics, and it might be added trained laborers to follow the various primary callings of production. The final reports of the 1913 Education Commission have largely been given effect to, but up to the present, the machinery has only been set in motion—greater correlation is desirable between the various educational institutions, and an enthusiastic public opinion to give the forward movement of true education, the momentum to be desired. In the education of the professional part of the community, we compare favorably with the other States, but in South Australia, and practically all the States, sufficient attention has not been given to the matter of education in those callings upon which at least 90 per cent. of our population must look for a living; namely—agriculture, its kindred industries, and the development of skilled tradesmen so necessary to secure the best results from our great resources. With regard to the latter the restrictions on apprenticeship make necessary some other method of training our youth. As for primary industries, it is becoming more evident as the years go on, that the inability to secure ample skilled labor in agriculture and gardening pursuits is retarding the development of these all important industries. By the beneficence of liberal donations from private individuals, supplemented by State financial assistance, a recognised deficiency in the matter of our educational requirements is being attended to, and the effect of these, shall I say the embryo of a new school of educational activities will undoubtedly evolve to the material advantage of the State. Institutions such as the School of Mines, the Peter Waite Bequest, the Roseworthy Agricultural College, our Technical High Schools, and the

recognition of agriculture in the University are doing an excellent service to the State. Professor Chapman in the course of an address at a recent conference of public school teachers in Adelaide said:—"Between the ages of 12 and 20 we have in South Australia about 67,000 person of both sexes. Of these something like 3,300 are attending secondary schools or the University, and about 3,000 are receiving some form of instruction at technical and agricultural schools; but the large proportion receive no educational training whatever after attaining the age at which school attendance is compulsory. Roughly, we may say, that nine out of ten of our children receive no educational instruction of any kind after leaving the primary school. To call this state of things unsatisfactory is to use altogether too mild a term. It would be only criminal folly for us to sit down contentedly to such a condition of affairs when we know that we have ultimately to enter into competition with other nations that are doing so much more. As a democratic State our progress, our prosperity, our place among the the nations, must depend upon a high average standard of intelligence and knowledge. The figures quoted mean that most of our apprentices receive nothing at all in the way of scientific training; that most of our young men enter into business without having acquired expert knowledge in matters relating to it. The majority of our young people lose the moral advantage that is provided by a regular course of reading requiring mental effort." Continuing, Mr. Hannaford said, "the fault lies not with the youth so much if time is spent in idleness or worse, but we deplore the indifference and lack of ambition in some individual cases. It is not only our privilege, but our duty to encourage those whose inclinations are towards higher attainments. Such a desire is not dead as witness the applications of members of the Bureau to attend the Winter School at Roseworthy Agricultural College. South Australia has always held a proud place in regard to the industry and capacity of her farming population, and has shown such an amount of progressive intelligence in the adoption of mechanical and scientific knowledge as to still keep the farming industry the first asset of the State. But we dare not relax our efforts if we are to maintain our position. Especially is this the case at this particular period of our history when the world's affairs so effect our well being. High cost of production with a falling value in produce is going to call out the best that lies within us. We must arm our youth if he is to win through in life's battles, when it meets him after his attaining the age of responsibility. We are not creating a scheme or machine for to-morrow only, but initiating something, the result of which will be revealed in the generations to follow. Other nations having realised the importance of education are stimulating it especially in the most essential matters, while science and agriculture is claiming a place in the very forefront of national activity. It is said competition is the life of trade, and it is equally true that knowledge is an imperative necessity for man to enable him to participate in, and to realise the best, that his Creator meant him to enjoy. You cannot have a success in business unless you are in possession of essentials that command success. There are walks of life where the alert and trained brain plays proportionately a greater part. In our political, domestic, social, and ethical walks of life we are always faced with problems, some old, some presenting new phases, and others altogether new. "Fields" there are awaiting cultivation, and our very place in the sun, as a nation, demands that we must be up and doing. I do not want to encroach on politics, but there are matters where the influence of the Bureau is valuable in forming public opinion and does not savour in the least of party politics. Let me mention one, forestry. What an immense amount of good can be done by the educationalist in that matter. South Australia in particular of all the States, has a poor timber supply, and at present with our small population, the common requisite of firewood is soaring with high prices. By teaching our young folks the necessity for economy in a national natural asset by conserving our present timber growth and an ambition to study how these matters are dealt with in other countries, we can go a long way towards minimising the difficulties of the future. People should be educated as to the most suitable trees to plant so that valuable time and energy shall not be wasted in planting and protecting unsatisfactory kinds, and a public spirit possibly engendered that will compel States and individuals to keep their hands off when ruthless damage and destruction is endangering a tree whose right to grow and be an asset to future generations is challenged by a passing whim or the infinitesimal loss that occurs to vegetation

through its benign presence. Forestry is now being taught, and our happiness and material wealth will be increased by the attention directed to the various influences that bear upon it. The same will apply to an increased knowledge of our bird life and their influence in the economy of nature as destroyers of insects and parasites. Our victories in the past should not tempt us to rest on our oars. The price of victory is eternal vigilance. Our wool men know that and the same applies to our other commodities. The world can do without practically every thing Australia produces, so if we are to go ahead, and we must if we are not to be swamped by rivals, we must educate and be educated, not only to succeed, but to exceed. We do not want to interfere with the schoolboy in choosing a vocation, but when a lad reaches the age of 16 or 17 we want him to be sufficiently informed as to step right off into the avenue that appeals to him, and to put within his reach those advantages that will the better help him to fight for the purpose he has in view. Our educational systems are honestly, I feel, doing what they can. We, who have reached years were experience should be a national asset, can place that at the disposal of younger men. We should remember that conditions change and younger men possess the advantages of impulsiveness and enthusiasm that will enable them to win through when difficulties assail them. Given a good moral training and the opportunity that is the inherent right of young Australia in the shape of education in its truest sense; i.e., vocation might not be necessarily one avocation combining utility with happiness; we will have a community that will, and rightly can claim to be a highly civilised people.

#### ROSEDALE.

August 17th.—Present: 18 members and 25 visitors.

MIXED FARMING ON A 200-ACRE BLOCK.—The President (Mr. Lehmann) read the following paper:—A 200-acre farm should be subdivided into three large paddocks of 55 acres, four six-acre paddocks, one four-acre block, and one of seven acres. The three large paddocks are for cultivation, of which one is to be sown, one fallowed, and the other left as grassland—this to be carried on in a system of rotation. The four six-acre paddocks are to be used for green feed, &c., two paddocks may be sown with barley, oats, or other green feed for winter months each year, and the remaining two fallowed, one of which may be used to grow summer fodders such as maize, sorghum, millet, &c. This paddock may still be put in with green feed after the summer fodder has been fed off. All that is required is to add a little extra manure to the soil. This should also be carried out in rotation. Should it be possible to grow lucerne without irrigation I should advise three acres to be cut off one of the large paddocks and put in with this fodder, but I should not advocate growing lucerne if it had to be irrigated. The four-acre paddock is set aside for homestead, stables, implement sheds, pigsty, fowlhouse, and vegetable garden. The seven-acre paddock is reserved for a vineyard and a few fruit trees. Although a vineyard and garden of fruit trees do not actually belong to a mixed farm, the profit derived from them, especially in a drought year, is very handy for the purchase of the necessary fodders. Beside this advantage, the working of the garden does not seriously clash with the working of the farm. Six horses would be sufficient, five of these to be draughts and one light enough to do the cart and saddle work. Four good dairy cows should be kept. By careful arrangement three should be constantly in milk. From 100 to 150 sheep could be kept, of which 50 per cent. could be good breeding ewes. The best of the ewe lambs should be kept to replace the old ones, so as to assure a good and young flock. The flock, however, should not exceed 150, as it does not pay to run yourself short of paddock feed, and then have to resort to hand feeding. Fowls.—Fowls are an essential on a farm, and 150 to 200 birds may be kept, as they are a profitable asset. I should, however, prefer the heavier to the lighter strains, as the former are not nearly so destructive, and, besides that, you will always be able to realise far more on your young roosters than for the lighter strain. Pigs.—Pigs thrive on the waste products of the farm, such as skim milk, peelings of root crops, &c., and with the addition of a little grain they could be fattened and sent to market. I should, therefore, advocate the keeping of three pigs, one of which should be a good breeding sow, so as to enable you to

rear your own pigs. But be careful to stick to good breeds, and do not rear stock of inferior quality. It is also advisable to have some extra fodder in reserve in case of a dry year. Therefore, nothing should be allowed to go to waste. Everything should be carefully stacked in case of an emergency. It has been proved that chaffed oats and barley straw mixed in equal proportions with hay chaff has kept young stock in good condition throughout a bad year.

At a further meeting, held on September 19th, the manager of the Turretfield Experimental Farm (Mr. S. E. Waddy) delivered an address, "The Economic Relation of Country to City Life."

#### VIRGINIA.

August 17th.—Present: 21 members and visitors.

PRODUCTION ON SMALL HOLDINGS.—In the course of a paper dealing with this subject the following remarks were made by Mr. W. H. Lang:—To make small holdings attractive and remunerative, all closer settlements should be situated in good rainfall districts or where other good water supplies are available. Where such land is not properly used it seems a great pity that so many returned men and others are anxiously waiting for a chance of making homes on the land and are not able to do so. The question strikes one, why do not landed proprietors give way and remedy these conditions? If such was allowed to eventuate much of the labor difficulty in the dairying industry would be overcome, as the first thought of a new land settler would be to purchase cows, which are so essential to the home for family use and income, and put his holding to a proper use

# GET THE IDEA

“YOU HAVE TO GIVE TO GET”

# APPLY THE IDEA



## GIVE YOUR LAND HEAVIER DRESSINGS OF

## WALLAROO M<sup>1</sup> LYELL SUPER AND YOU WILL GET HEAVIER YIELDS



and to its full capacity by growing fodder crops. I know of land in this State in a good fertile locality, which is maiden soil, and unfenced, and capable of growing annually thousands of cases of oranges and other products of commercial value that is fast becoming a home of noxious weeds. Closer settlement should be our one aim to do away with such intolerable conditions, and to settle young men who are anxiously waiting for an opportunity on the soil so that it may be put to its proper use. The Murray Valley is a wonderful achievement in closer settlement, principally in fruit culture, but other parts of the State should advance also if subdivided into small holdings. We must not forget that potatoes and many other commodities which can be grown here are imported into our State. Smaller holdings would keep much money within our borders, would make more good homes and desirable people, which are the greatest asset the State can have. It would also leave a smaller percentage of unemployed to become discontented with themselves and a perplexity to the whole universe to know how to solve such difficult problems. We find unemployment figuring very high in all countries, while prices are still very high for life's commodities. Thousands of these unemployed should be producers, enriching the country by producing wealth from the soil. All lands possible should be made available for closer settlement in suitable localities, so that decentralisation may speedily take place. We must remember that with a fair proportion of our population residing in rural districts it would also help to make such localities partly self-supporting. Young men should be induced to settle on the soil in preference to taking on other occupations when they are adapted for agricultural pursuits. In conclusion, we must admit that closer settlement or producing on small holdings means a more contented people, much more and varied production, more railway earnings, fewer importations, and enrichment for the State generally, making more export possible to increase our national wealth, and help to stay the stream of liabilities which seem to flood our country. In the discussion that followed Mr. Wright said he would prefer to have heard the subject dealt with from a more practical point of view for the benefit of young men, and considered it would be better to open up a lot more new country, and so extend the cultivated areas. Mr. Baker said he would have liked Mr. Lang to have given an expression of some definite line upon which he considered a young man should start, and asked the question, "Supposing a young man had an 80-acre farm in this district, in what way would you recommend him to start?" Mr. Lang replied, in the first place he would recommend a young man with 80 acres to go in for cows. Their district was near the city, and very good prices were ruling for dairy produce. In the second place, pigs were a very good paying line, and could easily be kept in conjunction with cows. Poultry should also be kept. Eighty acres was too small for keeping sheep. For fodders he recommended the growing of lucerne, mangolds, maize, and oats, and in a suitable block close to market he suggested the cultivation of vegetables. Mr. Stanton thought that large holdings were responsible for centralisation. Pinnaroo, as an example, at one time kept only 150 horses, but since it had been under closer settlement a great change had taken place, and there was now more people than there were horses. It took about 10 years to get a railway there, but since the line had been obtained it had become a new province. The River Murray was another example. Before it was settled it carried a good number of cattle, but now it kept more people than cattle. Mr. O'Loughlin also considered many large holdings could be put to better use if subdivided.

#### VIRGINIA.

September 21st.—Present: 21 members.

THE MANAGEMENT OF SMALL HOLDINGS AS SEEN BY THE ONLOOKER.—Mr. Townsend, in the course of a paper on this subject, said he proposed to make his paper take the form of a comparison of the management of two farms. Farm No. 1.—The first thing that thrust itself upon the notice of the visitor to the property was a rake placed in the opening where the gate was supposed to be hung. One also noticed, on inspecting the holding, that the plough was left in the paddock where it had completed the season's work a few months ago; the stripper was still standing at an old cocky chaff heap; and, on walking across the enclosure meant for the stable yard, the harness was noticed lying about on the

ground. Continuing the tour of inspection, one observed the pigs rooting in the garden, the fowls had taken possession of the kitchen, while a number of ducks could be seen in a mud puddle in the middle of the yard. Farm No. 2—The approach to this property was most inviting. A solid and well hung gate was provided; the approach to the house was in good order; the implement and vehicle sheds were conveniently situated, and the machines were under cover. A neat blacksmith's shop with the necessary tools was in evidence. The horse and cowyards were tidy and provision was made for drainage, while clean and roomy sties were provided for the pigs. The poultry were penned in suitable enclosures, and a small plot of land adjoining the homestead was devoted to the culture of flowers and vegetables. In addition to the proper keeping of the property, farmer No. 2 found sufficient time to attend sales and social gatherings, whereby he was kept in touch with the movements of the district. Such a thing was only possible by the farmer laying down a simple system whereby the work of the property was carried out in a business-like manner. The speaker drew attention to the fact that on too many holdings farmers did not make sufficient use of the means of conserving fodder. One too frequently saw the heaps of cocky chaff "go up in smoke" and the straw trampled under foot by the stock. For the working of a farm containing 500 acres, Mr. Townsend said he would subdivide that area into six paddocks, two of which should contain 100 acres each, one of the latter to be laid down to permanent grasses. If at any time the land required renovating, he suggested planting clover. As regards the keeping of sheep, it was important that the farmer should pay strict attention to the markets and seasons and regulate the flock accordingly. He would not keep more than three cows or one would be compelled to engage additional labor. If about 100 head of poultry from a reputable laying strain was obtained and the hens culled after 2½ years of service, one should be able to secure a good supply of eggs right throughout the year. In the event of the grain market being very low and high prices ruling for pigs, he would dispose of the cereals through the medium of the pigs. In concluding, the speaker made a brief reference to the advantages that were to be derived from the sowing of grass seeds with grain crops and suggested using clover at the rate of 5lbs. or 6lbs. to the acre. It would provide summer grazing after harvest and prove an excellent manure when ploughed into the land. An interesting discussion followed and the delegates to the Annual Congress (Messrs. Lang and King) gave a report of the proceedings of the gathering.

#### WATERVALE.

September 26th.—Present: 11 members and four visitors.

**FRUIT DRYING.**—In the course of a paper under the head "Fruit Drying on Small Holdings" Mr. A. S. Burgess said in drying apricots it was essential to have a sulphur house. A suitable box or frame could be made at home as follows:—Four pieces of timber 5ft. x 3in. x 1½in. for corners, four pieces 5ft. x 2in. x 1in. pieces for side stays and four pieces 2ft. 9in. x 2in. x 1in. for end stays. The stays should be securely nailed to the frame, one at the top, one half way down, and one about 2in. from the bottom. The frame could then be covered with bags cut lengthways, but care should be taken to see that the bags were carefully sewn and that each bag overlapped at the seams. The house, after being carefully whitewashed, would be capable of holding 30 trays each 4ft. 6in. x 2ft. Apricots should not be picked for drying until they have developed their full color on the tree. The fruit should be very carefully picked and handled. It it was not of a uniform ripeness and color it should be graded. Apricots were usually pitted or halved before being submitted to the sulphur fumes. A simple cutter, which he had found more useful than a knife, could be made as follows:—"Secure an old saw, cut a piece 6in. long x 3½in. wide out of it, then make a cut 1in. long in one end and bend the pieces, one each way, to form legs. Drill a hole in each, and then take out a shaped cut 2in. deep in the top and sharpen it to a fine edge, and screw the cutter to a piece of timber a little longer than a fruit case." By using the cutter over a case, the pips and any waste fruit were kept from getting all over the floor. It should be borne in mind, however, that the cutter should be kept sharp, for if a good sample was to be secured it was essential that the fruit be evenly and cleanly cut. Next, the cut fruit should be placed on the

trays with the pip side facing upwards, and so soon as possible it should be sulphured. For a house, such as had been described in the paper, 1lb. of sulphur was required, and the fruit should be exposed for not less than four hours. But, in that connection, he advised growers to use their own judgment and experiment for themselves, as much depended on the size and quality of the fruit. Apricots that had been properly sulphured should have the little cups, left by removal of the pips, full of juice and be soft to the touch. The sulphured fruit was then placed in the sun, and, in good weather, should dry in from three to five days. When taken up the fruit should be tough and pliable and boxed at the earliest possible moment, as fruit left exposed to the air had a tendency to go dark and was subject to the attacks of grubs. The usual practice with prunes was to dip them in lye to crack the skin. The strength of the dip recommended by many growers was 1lb. of caustic soda to 10galls. water, but he had found that if the fruit was ripe and sound, half of that quantity was sufficient. If rainwater was used, the fruit should be dipped for 7secs. If the weather was very hot, one should not place the fruit in the sun as it was liable to scald. It was better to leave the trays stacked and make allowance for plenty of ventilation. The fruit would then not take very long to dry. The prunes should not be over-dried, but placed in boxes to sweat until they would not exude moisture when squeezed in the hand. The sweat boxes, as used for currants, were suitable for that purpose as the fruit could be readily examined and stirred about if it showed signs of fermentation. Before being boxed, prunes were usually dipped again to remove dust and dirt. When doing that it was advisable to have the water just below boiling point to kill any grubs that might be in the fruit. Whilst undergoing that process it was usual to add a small quantity of glycerine or olive oil to the water to give the fruit a nice gloss. In drying Duchess pears, the point of most importance was to see that the fruit was clean, sound, and ripe. The fruit was usually cut in halves lengthways and the stem removed. Any blemishes, which appeared when the fruit was opened, should be removed and the pears taken to the sulphur house without delay. The fruit should be placed flat side up and sprinkled with water before placing them in the house. To obtain a nice light color, the pears should be sulphured twice, using 1½lbs. of sulphur first and 1lb. the second time, allowing not less than six hours between each treatment. After each sulphuring, the pears should not be exposed to the sun if the weather was hot, but stacked and dried in the shade. Great care should be used in packing the dried product for it should be borne in mind that cleanliness was a great factor in the successful disposal of the product. It was a good plan to line all boxes with clean white paper and carefully pack both the top and bottom layers so that when the box was opened it would present an attractive appearance to the buyer.

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CLARE, September 16th.—Mr. J. Butler, who attended the Winter School for Farmers at the Roseworthy Agricultural College, gave an interesting report of the proceedings.

LYNDOCH, September 22nd.—The Hon. Secretary (Mr. J. S. Hammatt) gave an interesting report of the proceedings of the Annual Congress. Mr. H. Kennedy read an article, "Herd Testing," and a good discussion followed.

MALLALA, October 3rd.—Mr. J. C. Catt, who represented the Branch at the Annual Congress, gave a very clear and detailed account of the various sessions of the gathering.

NANTAWARRA, September 15th.—Mr. A. R. Herbert, who attended the Short Course for Farmers at the Roseworthy Agricultural College, gave an interesting account of the subjects as set out in the curriculum. Particular interest was evinced in the subjects, "Grading and Pickling of Wheat," "Care and Killing of Pigs," "Feeding and Breeding of Dairy Cattle," and "Breeding and Points of the Horse."

SALISBURY, September 6th.—Papers on the subject "Vegetable Growing" were contributed by Messrs. W. J. Halliday and C. Baker, and an interesting and instructive discussion followed.

**SALISBURY**, October 4th.—An excellent report of the proceedings of the Annual Congress was given by Mr. R. H. Bagster, and an interesting discussion followed.

**WILLIAMSTOWN (WOMEN'S)**.—Mrs. Wild read a paper "The Infertile Egg Association," and the Hon. Secretary (Miss G. Hammatt) gave a report of the proceedings of the Annual Congress.

**WILLIAMSTOWN (WOMEN'S)**, September 10th.—The Hon. Secretary (Miss Gwen Hammatt) gave an interesting address on "The Food Value of the Jerusalem Artichoke." The speaker kindly distributed a number of tubers among members and advised planting during the month of September.

**WINDSOR**, September 20th.—Messrs. N. Baker and H. White, who represented the Branch at the annual Congress, gave an interesting report of the proceedings, and a lengthy discussion followed.

## **YORKE PENINSULA DISTRICT:**

(TO BUTE.)

**KADINA** (Average annual rainfall, 15.88in.).

September 2nd.—Present: eight members.

**DAIRYING**.—In the course of a paper on this subject Mr. H. Thompson said it was his intention to make his paper take the form of an account of his experiences in dairying. The paper then read as follows:—"I shall base my calculations on a herd of 30 cows, and although this district is not by any means an ideal one for dairying, it can be made a payable proposition. My 30 head of stock this year have used about 100 tons of hay and 800bush. of corn. Bran has been at times

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almost unprocurable and the price prohibitive, so I obtained the advice of the Government Dairy Expert, and find that crushed grain contains the same milk producing qualities as bran. The 800bush. I mentioned included feed for pigs. To produce 100 tons of oaten hay on an average means 50 acres, and (note difference) 1,200bush. of barley (counting 15 bushels as an average) needs roughly 80 acres; say, 40 acres in two paddocks sown with barley for green feed, and allowing 80 acres for a grass paddock to run dry stock on, the least land that a dairy of 30 cows requires is 300 acres. To have a wheat-growing farm of 300 acres you would not crop much more than 200 acres per year. Two hundred and fifty acres, with an average yield of 12bush. at, say, an average price of 4s., would return a gross income of £480. I am not allowing for horse feed for putting in and taking off the crop, because the expense would be approximately the same for both dairying and wheat farming. I have allowed 220 acres to be put in each year for the dairy, because the majority of the land is either fed off or cut for hay, which does not take as much out of the land as wheat growing. When the policeman came to my place last year to collect the statistics, I looked over the average yield of milk per cow. In the majority of instances it was given as 2galls. all the year round; that is about my average, but I intend to increase this. In passing, I may state it is a deplorable state of affairs. No sane farmer will expect a team of cart horses to pull a plough, or a buggy horse to win a race; they must be bred for the purpose for which they are required. The same applies to cows. In this district it seems as though any old sire will do as long as the cows get in calf. The heifer calves are kept, and the nearest bull is used again. And so it goes on, with the result that nearly every farmer gives his average yield as 2galls. To be on the conservative side, I reckon on an average of 2galls. of milk per day to produce 6lbs. of butter per week. Dairy butter is about 1s. 6d. at present, and on an average of 1s. 3d. returns an income of about £585. Other Sources of Income.—Thirty cows would have about 20 calves per year. After the first year or two the dairy farmer could count on selling 20 head of cattle per year. If you keep the heifers you could sell the older ones. Counting these bringing only £5 per head, means another £100 per year. Again, if you have pure-bred stock you can get a lot more for them. If the bulls were pure bred a portion of them could be sold at £10 10s. or more per head at nine months old. Counting on 20 calves per year, you would have probably five to be handfed all the time, taking about 15galls. per day of skim milk, leaving 45galls. to be fed to pigs, which, with crushed barley, would feed 20 pigs. If these were sold off at five months, you would have about 50 pigs per year to sell at an average of £3, making another £150 income, or a gross income of about £835 per year. Cost of Running the Dairy.—With the aid of a milking machine, two lads of 18 or so could milk the 25 cows that would be in milk all the time. They would feed the calves and pigs, and wash up under three hours each milking, leaving time in the middle of the day for cropping, cutting chaff, &c. It would really require two to work the land for wheat, so the cost is about the same. A girl could be one of the two doing the milking. I am milking 21 cows at the present time on a cost of 1s. per milking, or £36 per year; allowing £4 for depreciation, the machine costs £40 per year. Counting 30 cows and one bull to start at £12 each, £372; machinery, £250; sheds, £100; 6 per cent. on those amounts is roughly £45. Dairying shows a gross income of £835, less running cost £85, leaving £750, against an income of £480<sup>0</sup> on the same land for wheat growing. Of course, dairying is more of a tie than wheat growing, but if the figures I have given are correct, that will more than pay for the tie. Cows are nothing more nor less than extremely sensitive machines for producing milk, and the least annoyance upsets the machinery, and you do not get the milk. Cows like the milking machine. Of the 26 cows I have I only leg-rope two. Milk is only a purified blood, and to get the best results, cows must be milked with a system to allow the machinery of a cow to turn the blood to milk when you are ready to take it. Regarding breeding, I favor either the Friesian or Holstein for this district, where for the major portion of the year they have to produce milk from dry food. These breeds leave the Jersey far behind. Although their butter fat percentages may not be as high in the spring as the Jersey, taking the year through they will give an equal quantity of cream. Besides, where the skim milk is valuable in the shape of pigs' food, the larger quantity the better, especially in the summer when butter is dear. Also those that have to be sold bring far more money from the butcher."

MAITLAND (Average annual rainfall, 20.08in.).

October 1st.—Present: 16 members.

FALLOWING.—In the course of a paper dealing with this subject, Mr. C. C. Parsons said fallowing and the subsequent treatment of land had a very important bearing on the success of the crop. As a general rule he was of the opinion that it was a mistake to allow the land to lie for any great length of time in large lumps or clods. It should be harrowed down so that the weeds seeds would germinate. The subsequent workings not only destroyed a greater number of weeds, but also allowed a better conservation of moisture. In addition to that, chemical and bacterial activity, that was so necessary to the growth of cereal crops, was promoted. It was a good plan to have the surface of the soil in a loose condition during the summer months, and, in the event of heavy summer rains falling, the land should be worked as soon after harvest as the teams were available. In the discussion that followed, Mr. O. Jones thought it best to harrow the land at the earliest possible moment and favored land ploughed between harvest and seeding for fallow. Mr. A. M. Kelly agreed with the previous speaker and favored a narrow cutting plough for the work. Mr. Parsons believed in ploughing as much land as possible before seeding. He had frequently noticed that on the strips of land that were ploughed for firebreaks the crops appeared to be better than other parts of the paddock.

DOWLINGVILLE, September 22nd.—A report of the Annual Congress was tendered by Mr. F. Crowell, and an interesting discussion followed.

PASKEVILLE, September 20th.—The meeting was devoted to discussions on various subjects of local interest. It was decided to place on record the good work that had been done for the Branch by Mr. R. F. Angel, who intimated that he was leaving the district.

## WESTERN DISTRICT.

BUTLER (Average annual rainfall, 16.61in.).

September 19th.—Present: 15 members and six visitors.

CARE OF FARM HORSES.—Mr. P. R. Parker contributed a paper on this subject. He said every care and attention should be given to the team because the farmer was almost solely dependent on their services for the work of raising and harvesting the crops. A warm stable was a necessity and each horse should have its own stall. Regular feeding hours should be kept and water given not less than three times a day. Good hay chaff should be used for feeding and a little hay given to them at times was good for their teeth. Every teamster, by a little observation, should know the amount of feed that was required by each horse after working it for a few days. Horses should be fed early in the morning and be allowed at least two hours before going to work. They should not be made to work a full day after being brought in from a spell. Every horse should be provided with a good fitting collar for its own particular use. The team should not be worked after sundown, and six to eight hours was sufficient for any horse to work. No mare should be worked while the foal was sucking. The mare should be kept in good condition, and when the foal was weaned it should be fed and not turned out to look for its own living. Horses should not be broken in under three years, and only light work given for the first 12 months. In the discussion that followed, members thought that it did not hurt to work horses longer than six or eight hours provided they were fed well, and it was thought that the colt could be broken in before he was three years old providing he was in good condition.

In a short address, Mr. D. B. Butler spoke on "The Class and Breed of Horse Most Suitable for Farm Use." He had had a good deal of experience with horses and found that the crossbred horse was most suitable for general farm use. He favored the clean, big-bodied horse, one that had a fair amount of weight coupled with activity. Mr. N. G. Stewart also spoke on the same subject and favored the medium weight trolly horse.

## ELBOW HILL (Average annual rainfall, 11in. to 12in.).

August 23rd.—Present: seven members.

THE FARM HORSE.—In the course of a paper dealing with this subject, Mr. P. Wheeler said many farmers failed to realise the full value of the horse to the man on the land. The driver should make a study of his horses and be able to tell immediately when a horse was not comfortable in his harness. He should also see that each horse was doing no more than his share of work. The only successful way to work a team of eight or more horses was the tandem system with the aid of equalisers. The horses did not then have the weight of the swings to carry, and it was much easier to make them work evenly. Sore shoulders were usually a source of worry to the teamster, but if a well-fitting harness was used, and the collars put on carefully, there should not be very much trouble. The speaker believed that by frequently changing the position of the draught of the hames, the strain on one particular part of the shoulders would be overcome and the danger of the horse developing sores would be considerably minimised. In the discussion that followed, Mr. Gribble favored the tandem team and thought a false collar made from a bag a good preventive for sore shoulders. Messrs. Ramsey and Cooper did not favor the tandem team. They thought that method of working the team would make very little difference in the weight of the swings. Mr. Cooper thought it hard to prevent free horses from chafing on the shoulders. Mr. Williams preferred the tandem team. To prevent sore shoulders he thought one should be careful to remove any lumps from the collar. Mr. Pearce thought a good-fitting collar would do much to prevent sores from developing on the shoulders. He favored a steel collar and would work large teams in tandems. Mr. Cowley was of the opinion that a good deal of the trouble was caused through the collar and harness being put on carelessly. He favored the tandem system of working the horses and strongly advocated the wooden collar.

## KOPPIO (Average annual rainfall, 22.40in.).

September 12th.—Present: seven members.

A considerable discussion took place on the subject of a Government Veterinary Surgeon for Eyre's Peninsula, which was to be brought before the Minnipa Conference. Mr. H. Roberts asked if members had noticed any marked difference in the crop following peas as regards yield, color, &c. Mr. W. R. Richardson had grown a considerable quantity of peas successfully and he had not noticed any marked improvement until the present season, when a crop of oats following peas last year seemed much more healthy, &c., than previous crops on the same land. Mr. E. W. Price had noticed a vast improvement in a field of Golden Drop and Queen Fan wheat. He tabled a sample of the former about 4ft. high, which was very much admired by members.

## McLACHLAN.

Present.—September 3rd.—Present: 15 members.

HAY GROWING.—Mr. W. F. Attick, who read a paper on this subject, said the paddock intended for the hay should be well worked, have all stumps cleared off, and made as level as possible. He strongly recommended the rolling of the land as the final operation. The land would be made even, and then one would be able to cut more hay to the acre, and the work would not be so rough on the binder. For that district he expressed a preference for King's Early for the hay crop. It grew quickly, had a good flag, and was relished by the horses. Oats could be sown after the virgin land had carried two or three crops of wheat, and would return a good crop of hay. He thought it was best to cut the hay a little on the ripe side, because when it was stacked it would "come back in color." It was a good plan to sprinkle each layer of sheaves with a few pounds of salt as the hay was being stacked. He thought it was best to leave the hay in the paddock for a fortnight after cutting, in order to make certain that it was well cured. The stooks should be made to provide for a free circulation of air to pass through them. In the discussion that followed, Mr. Kloppe thought oats should be grown for hay in light country. Mr. Hawke also favored oats. Other members were

of the opinion that oats should be reaped and the stubble burnt to act as a strong check to the growth of shoots. An interesting address, "Inbreeding," was then delivered by Mr. Bailey, and a lengthy discussion followed.

#### TALIA.

September 24th.—Present: 9 members.

LAYING OUT FARM BUILDINGS.—Mr. A. L. Robinson, who read a paper on this subject, said care should be taken when laying out the farm buildings to have all the sheds, &c., arranged conveniently close to work and within, say, 150yds. of the house. The house should be erected on a high piece of land, not in a corner or side of the new block unless water could not be obtained elsewhere. The sight selected for the water supplies should be tested before making permanent structures. On a good drained slope, the stables and sheds should be erected. The stables should be separated from the implement sheds by at least twenty yards to minimise the danger of fire spreading should one building catch fire. The blacksmith's shop, an important building, should be near, but not joining the implement shed. By a little forethought in the layout of the buildings a great saving of labor and real gain to the farmer could be obtained and the attractiveness of the holding would be considerably enhanced. The Chairman (Mr. P. A. Thomson) gave a lengthy address on his impressions of the Annual Congress, expressing his appreciation of the sessions as instructive and interesting. A description of the Royal Show was also much appreciated by members.

#### YADNARIE (Average annual rainfall, 14.09in.).

September 6th.—Present: eight members and five visitors.

MARKETING AND WEIGHING WHEAT.—Mr. W. H. Way contributed a paper on this subject and in the discussion that followed, Mr. A. Jericho was of the opinion that the fixing of the standard of wheat by the Government was done too late in the season, because the greater part of the farmers' wheat had then been delivered and sold under the standard of the previous year. Mr. F. W. Jericho thought that there should be a fixed standard which should continue for a number of years. Mr. W. E. Hier thought that the Government was unable to fix the standard of wheat until the wheat was reaped. The wheat should be weighed with a standard fixed scale. The President (Mr. O. Forbes) said that the weight of a bushel of wheat should be ascertained by buyers and agents with a standardised set of scales. In fairness to farmers, he thought that the standard of wheat should be a fixed standard for a number of years. He did not favor having three grades of wheat. Mr. A. Jericho then read an interesting extract on "Take-all."

GOODE, September 14th.—On the occasion of the annual meeting, the Hon. Secretary (Mr. P. T. Morcombe) presented the report of the work done by the Branch during the past year, and the officers were elected for the ensuing term.

SALT CREEK, September 6th. A short paper on the subject, "Wasters on the Farm," was contributed by Mr. G. Barber. The chief point brought forward by the speaker was the fallacy of keeping old stock on the farm. Mention was also made of the time that was wasted by the constant repairs that had to be effected to old and worn-out machinery. In reply to a question from Mr. L. Guidera as to the best depth for fallowing in the Salt Creek district, members were of the opinion that 3in. would prove sufficiently deep for most of the soils in that locality.

YANINEE, August 26th.—After the lapse of about 12 months a meeting was held when a keen interest was taken in the resuscitation of the Branch. The Hon. Secretary (Mr. R. G. Hicks) urged those present to take an increased interest in the work of the Branch, and pointed out the many advantages accruing from making their occupation as interesting and pleasant as possible.



**EASTERN DISTRICT.****(EAST OF MOUNT LOFTY RANGES).****ALAWOONA.**

August 19th.—Present: eight members.

**THE POULTRY INDUSTRY.**—Mr. H. Clough, who contributed a paper on this subject, first quoted a number of interesting statistics which showed the extent and value of the poultry industry to the State. If the industry was to maintain its present high status and make an increase it was most important that none but infertile eggs should be marketed. On the majority of farms the poultry were treated as a very minor side line, and the fact that one heard so many complaints about the condition of store eggs proved that the farmers were to blame, because the bulk of the supplies came from the agricultural centres. All roosters other than those required for the breeding pens should be fattened and forwarded to the market. The indiscriminate running of the roosters with the hens was responsible in no small degree for the number of stale eggs that found their way to the table. He did not express a preference for any particular breed, but the farmer should obtain pure-bred birds of a breed that he had a liking for. He believed it would be a good plan if each new settler was to establish on his holding a small flock of pure-bred utility birds and build up from them a flock that would develop into a regular source of income. An interesting discussion followed.

**BORRIKA.**

September 7th.—Present: 11 members.

**FEEDING CALVES AND PIGS.**—In the course of a paper dealing with this subject Mr. Griffiths said he made a practice of allowing the calf to suck its mother only on the first day after it was born. For the first week it could be fed with eight pints of new, and four pints of separated milk each day, after which the skim milk could be increased by one pint daily, until it was a month old, when it should be able to eat a little hay or green feed. After four weeks old he substituted one pint of skim milk for the fresh milk each week until the calf was being fed wholly on separated milk. Referring to pigs, the speaker expressed a preference for the Mid-York and Berkshire cross. It was a good plan to get into the sty with the sow every time she was fed during the fortnight prior to farrowing time. She would become accustomed to a person being in the sty, and one would be able to assist the litter should there be any need to do so. If a rail was placed around the sleeping shed about 9in. from the ground and the same distance from the wall it would give the young pigs a chance to get away from the sow when she wanted to lie down. The sow should not be fed for the first 24 hours after farrowing, after which time she could be given slop food without milk. When the pigs were a month old he placed a small flat bottomed trough outside of the sty and fed them on skim milk and pollard. The pigs could be weaned at seven weeks old, but he did not make a practice of giving them corn until they reached the age of three months. In reply to a question Mr. Griffiths said he would castrate the young boars at five weeks old. Members reported the presence of numerous foxes in the district.

**CLAYPAN BORE (Average annual rainfall, 16in. to 17in.).**

September 9th.

**LAMB MARKING AND THE BLOWFLY PEST.**—In the course of a paper dealing with this subject, Mr. G. Bickford said he preferred the "slit" method of castrating lambs although the practice of opening the purse had a good number of supporters. When performing the operation, a knife with a curved and sharp point should be used, a slit then made in the purse about an inch from the end and when the testicles had been removed the ends should be pressed together. If that method was adopted, the wound would heal quickly and keep out the cold air and dirt. Of the two methods usually adopted in tailing the lambs—the searing iron and the knife—the speaker expressed a preference for the latter, because the operation could be performed more quickly and cleanly than with the iron. The

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tail should be cut off, leaving a stump about 2in. long. The speaker suggested marking the lambs when they were about six weeks to two months old. Referring to the blowfly pest, he thought that careful and systematic dipping carried out at the right time would go far towards minimising the danger of sheep being struck. The dipping should be done from two to four months after the sheep had been shorn. One of the best preventive methods was the use of the jetting plant by which the dip was forced into the wool. With the use of such a plant, it would not be found necessary to crutch the sheep. He strongly believed that in those districts where the fly was exceptionally troublesome, farmers would be well advised to co-operate and purchase a jetting plant. Four pints of powder to 10galls. of water was usually used as a preventive, but for those sheep that were badly blown half the above-mentioned strength should be applied and followed by an application of boracic acid. If that procedure was succeeded by an application of the full strength solution he felt certain a cure would be effected. The dip could also be used for protecting marked lambs by sprinkling the solution over the tail and purse and the head and neck. If possible, one should avoid putting the dip on the wounds on the sheep. One should endeavor to allow the sheep to dry in the shade after being dipped in order that the greater part of the solution would have time to penetrate right through the fleece.

#### LAMEROO (Average annual rainfall, 16.55in.).

September 10th.—Present: 16 members and visitors.

**HORSE SHOEING.**—In a paper dealing with this subject Mr. H. E. Crispe said when fitting the shoe to the hoof care should be exercised not to rob the hoof of, or leave too much, horn, as either mistake might lead to injury. Of the many factors to be considered when preparing the hoof, the most important was to keep the foot perfectly level, thus preventing undue weight being thrown on any one part. The frog should not be touched beyond removing tags, or layers, that were loose and that would not be of any use or protection to the horse. The object sought was to make the foot normal, and the shoe made to fit the foot; not the foot fit the shoe as was too often the case. When levelling the hoof one should carefully note the wear of the old shoes as they often indicated evidence of the manner in which the hoof had been set to the ground since the shoe was last nailed on to it. He did not think it wise to place a hot shoe against a freshly pared sole, as not only was it likely to cause the animal pain, but it might lead to permanent injury. In nailing the shoe to the foot the nails should not be driven too near the edge of the sole, for in such cases it was necessary to drive the nails too far up into the wall to make them hold. On the other hand, if the nails were small in size and set well back, they can be driven so as to come out well down on the hoof, from 1½in. to 1¾in. above the shoe; nails thus driven would not destroy but a small amount of horn; they made a strong wide clinch, and gave the strongest possible hold on the wall because the clinch held nearer at right angles to the grain of the wall than if driven high. After driving, the nails were clinched and smoothed with a rasp. It was a mistake to rasp the outside of the hoof, as it would remove the natural protection covering. In some cases it was necessary to reset shoes frequently as the hoof grew out over the shoe, thereby causing the shoe to bear on the sole instead of the wall of the hoof. The frequency of resetting depended upon severity of work, nature of footing, and the individuality of the animal. Some horses at severe work required their shoes reset almost weekly, while others at light work suffered no effects if the shoes were left on eight weeks or until they became worn out.

#### LONE GUM.

August 17th.—Present: 28 members.

Mr. Halliday contributed a paper, "Care of Horses," and a good discussion followed.

At a further meeting, held on September 14th, the meeting took the form of a Free Parliament, and a pleasant and instructive evening was spent in discussing several subjects of interest to blockers.

## RENMARK (Average annual rainfall, 10.93in.).

August 18.—Present: 53 members.

TREE SURGERY OR TREE DENTISTRY.—Mr. C. A. Ritchie read the following paper:—Some time ago Mr. Muspratt, having read of what was being done in America by the tree surgeon, thought he would see what could be done to save some of his orange trees in which the decay was spreading. The first trees I tackled were lemons that had been cut over almost level with the ground and budded with the navel orange. The butts measured from 6in. to 12in. across, and as the root system was in full swing they sent up suckers all round. To stop that, and at the same time to help feed the new graft, shoots were inarched into the stem, and these were rather a nuisance, as some of them were so close together as to make it very difficult to get to work with the chisel on the old stump. Those were, of course, very much cracked, as they had no protection whatever after the lemon trees were cut over, and the fierce heat of the sun soon opened up the way for water and spores to enter and do their work. It is rather remarkable that the outside surface should be so hard, while the substance of the wood beneath should be soft and powdery, and where at all moist infested with all kinds of boring grubs. After doing a few roots I found that by smashing in the surface with a hammer I saved a lot of time that would otherwise have been spent with the chisel. As the stumps were so low down it was often a very awkward job getting at the work, and rather than cut away any more good wood or bark I had often to undercut to a considerable depth before removing all decayed and discolored wood. No halt in the cutting was called until a good healthy color of wood was reached. In some instances the rot had not penetrated far, but in others it had gone right through, necessitating a clearance being made below the root and a foundation put in of tar and sand before filling with cement. Again the rot would run down into the big main roots, and these had to be bared, and if too far down to clean out, an opening was made in the side of the root until all decay had been removed. It was the intention only to disinfect and paint all wounds below the surface of the ground, but I thought I should like to do a bit of the surgeon's bone grafting. The cut surface was studded with nails (1½in.) and the decayed part replaced with cement. Six months later the bark below the surface was making almost as good growth as that above. The other trees had been budded on the limbs, and in those a good deal more cutting-out had to be done, but much more progress could be made with them, as they were easier to get at. In many cases only a shell of the main stem was left, and in some of the limbs it was the same, so much so that it became imperative to tie them to prevent breaking off. In many instances the decay had begun at an elbow where a cut had been made. The auger was employed to bore down a foot or 18in. right into the centre of the tree. After the cutting had been done, the surface was painted with Bordeaux mixture to kill any spores that might be left or that might have settled on the freshly cut wood, and next day painted either with oil paint or ruberoid paint. The latter being black you were more certain that you had covered the whole surface than with the white paint, which did not show too well on top of the Bordeaux mixture. The next step was reinforcing with nails driven into the wood all round the edges, keeping clear of the bark; and if there seemed any doubt of the nails making a secure hold for cement, wires were crisscrossed from side to side to bind it thoroughly. Sometimes the cut was overhanging or straight up, and then a small piece of half-inch wire netting was secured by nails and embedded in the cement. The cement used was in the proportion of two of sand to one of cement, and as little water added as possible, so as to leave it fit for ramming. A handful of the mixture that would just break, when dropped 6in. or so after being squeezed, was about right. In most cases pieces of tin cut to shape were nailed round the openings to keep in the cement while tamping, and when the space to be filled extended 3ft. or 4ft. up the stem those had to be added one after another as the work progressed, the upper one being slipped inside the edge of the lower so that no cement would drop out. A 10in. bolt made a very good rammer. On the completion of the filling the tin covering was removed and the whole surface pared to the desired shape, and then having been sprinkled with water it was smoothed over with a well-worn tea knife until the whole surface looked like glass, making it quite impervious to water. A point was made of never leaving a hollow in which water would lie, but sloping it off to make a good run. In cementing along

the limbs it was often impossible to do any tamping, so the cement was made more moist and simply pressed into position with the hand, and, so far as could be seen, it was almost as good as the rammed cement. In painting it is not at all necessary to finish the edges as a coach painter would finish his work, as we found paint would not stop the growth of the new bark. Another thing I might mention is that when doing the fruit trees I cut away about an inch of bark all round the cement to give the new growth a good start. It is quite evident from observation that new bark will not grow over wood after decay has proceeded for some time, and I found one limb where the new bark had nearly covered the branch beneath the decayed wood. Now cement will not rot, so I see nothing to stop the growth of the new bark. In six months' time some trees showed a growth of from half to three-quarters of an inch. My average was somewhere about four trees a day, and the painting and cementing did not occupy more than an hour or two hours at the outside for the very worst cases. The tools used comprised a set of gouges— $\frac{1}{2}$ in.,  $\frac{3}{4}$ in., and 1in., a good 1 $\frac{1}{2}$ in. chisel, augers up to 2in., a mallet and hammer, and a good single-handed ratchet. I found the hammer more expeditious owing to the concentrated weight. A scribing gouge is sharpened from the inside of the hollow and not on the back, and consequently you get a grip of the wood when an ordinary gouge would refuse to bite. I nearly forgot to mention another useful adjunct, viz., a pair of bellows to blow the dust and chips out of deep hollows. In most of the trees, especially where the cementing had been done on the limbs, a  $\frac{1}{2}$ in. iron rod was used to tie the limbs together, and in some cases twisted wire was used to take the strain and prevent swaying during a gale. Following the reading of Mr. Ritchie's paper and its illustration by a number of lantern slides, a short discussion took place. In response to questions, Mr. Ritchie said that he had no personal experience in the

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practice of tree surgery on deciduous trees, but he had read of the application of this treatment to pear trees, and an English magazine had reproduced views of deciduous trees so treated. As a preventive of white ants in trees and vines there was nothing more effective than corrosive sublimate—half a teaspoonful to a pint of water. It was effective also against black ants, and was not injurious to plant life.

#### ROSY PINE.

Present: nine members.

**HOW TO WORK A NEW MALLEE FARM.**—“The first thing the new settler should do on taking up his block is to select the site for the homestead,” said Mr. C. Lee in a paper dealing with the above subject. Continuing, the speaker said when that first point had been decided upon a paddock 10 chains square should be marked out and the natural timber left growing on it. Next, a good sheep and vermin fence should be erected to keep the rabbits from the garden and the foxes from the poultry. This homestead paddock should be on rising ground as near the centre of holding as possible. The house should be constructed of reinforced concrete or stone with a verandah all around to keep off the heat in the summer and the damp in winter. Three or four hundred pounds spent on the homestead was a better and wiser proposition than spending it on a motor car. As their district was supplied with plenty of water underground they could put the bore just where it would be of most service. He favored putting the bore about half way between the house and the stables. If possible, the stable should be built on ground that could be easily drained and facing to the east, with 10in. of 2½in. broken metal to form a floor, with a 6in. fall from the manger to the front of the stable to allow all water to drain off and to keep the horses dry and the bedding clean. The stable should be built with reinforced concrete or stone. For the roof he suggested a 5ft. or 6ft. gable with cross tie beams. The yard should be constructed of good posts and rails—not barbed wire—and with an 18ft. trough well protected in a convenient place. Regarding the laying-out of the paddocks, the speaker did not favor clearing too much scrub off the first year. He believed that it would be better to clear a paddock, 80 chains x 50 chains, which would give 400 acres the first year, and place a ring fence around that and divide into, say, two paddocks. One field could be made sheep-proof and sown with oats and Cape barley early in March for grazing. The other paddock of 300 acres he would sow with wheat, 150 acres each of early and late Gluyas. The second year another 400 acres could be cleared and the feed paddocks could be left out for fallowing. Land worked in small paddocks of, say, 150 acres, would give a better return than big paddocks, even though one incurred additional expenditure in the extra fencing that was involved. In the discussion that followed, Mr. Schiller did not favor the erection of sheep-proof fencing the first year, because one would not be able to secure a burn if a portion of the crop was grazed off. He considered a burn of greater importance than keeping sheep. He also thought it would be better for the settler to start in a small way, and gradually improve the farm as his financial position became stronger.

#### WINKIE.

September 5th.—Present: 29 members and three visitors.

**PLANTING CITRUS AND DECIDUOUS TREES.**—Mr. C. Plush contributed a paper on this subject. The soil should be ploughed to a depth of 8in. or 9in., and if of a stiff or clayey nature it should be given a dressing of gypsum or lime. Subsoiling was also very beneficial in hard, heavy soils, but as most of the land in that district was of a deep sandy nature it was not necessary to resort to that practice. After ploughing the lands should be harrowed both ways, because that would conserve the moisture and help to level the ground. The next procedure was to obtain the grade or angle for watering, which was very important. He would use a level, and would not trust wholly to the eye. If there was too much fall the furrows would deepen against the channels after a few irrigations, and the soil would silt up lower down the row, causing washaways, and later, if one was not careful, seepage would appear. Trouble would also arise when irrigating, and when the trees and vines

were in full bearing they would not receive enough water. On his own orchard he had the best results where the watering was nearly level, or with a fall of not more than 4in. to the chain. A fall of about 4in. to 6in., but not exceeding 9in., would give the best results. He would do as little grading as possible; it was better to change the angle of the row instead of taking the surface soil to fill a hollow. The distance required for headlands should then be measured. Twenty-four feet, he thought, would be found to be the most convenient, but they should never be less than 20ft. Some of the best distances for planting different trees were oranges, 27ft. by 24ft. or 24ft. by 22ft.; mandarins, 22ft. by 20ft. or 20ft. by 20ft.; apricots, 24ft. by 24ft. or 22ft. by 22ft.; peaches, 24ft. by 22ft. or 20ft. by 20ft.; pears, 20ft. by 20ft. or 20ft. by 18ft.; currants, 12ft. between rows and 10ft. to 11ft. apart; sultana vines, 11ft. or 12ft. between rows and 7ft. or 8ft. apart; Gordo, &c., 10ft. or 11ft. between rows and 6ft. or 7ft. apart. After pegging out the distances, planting could commence. On receiving the vines or trees from the nursery they should be heeled in. The bundles should be opened and the trees separated to allow the earth to cover all the roots. Two or three buckets of water could then be thrown over them to settle the earth and freshen the young trees. By heeling them in hundreds down the headlands where planting, a considerable amount of walking and carrying could be saved. When planting, enough trees should be taken out to plant one row, and, after cutting off any broken roots, &c., those not immediately required could be placed in a tub of water. The holes should then be dug. It was not advisable to dig all the holes and then leave them open for some days; that would cause the walls of the hole to become baked hard and dry by the sun, and prevent the young roots from penetrating the soil freely. For planting deciduous or citrus trees, the holes should not be less than 18in. square, with earth mounded in the centre. The mound was important, because it caused the roots of the tree to spread out and downward. Pot holes should be avoided, especially in heavy land. If clay was near the surface he would plant on the surface, and not dig the clay out if the land had not been subsoiled. If the clay was taken out in land not subsoiled it would cause the water to drain and lie under the tree, resulting in the roots rotting and so partly or wholly killing the tree. The holes should not be made too deep. After having dug sufficient holes for one row the trees should be planted. With deciduous trees or vines a tree could be placed in each hole preparatory to starting if the weather was cool, but with citrus fruits the roots should be kept in a moist condition until ready for planting. The following was the method adopted by the speaker in setting the trees out in the orchard. Use a planting board with a V cut out of the centre and ends. Place the stem of the tree in the centre V, with the nursery wound away from the sun, resting the tree on the mound with the roots facing downwards, separating same so that they are evenly distributed over the hole, taking care to keep the tree 2in. or 3in. above the V than it stood in the nursery. This is to allow for settling in hole. Then sprinkle fine soil gently over same until the roots are well covered. Next press the soil down firmly with your foot and fill in the remainder of the hole. If planting with an irrigation do not use the second lot of earth, but fill the hole with water. After the water has soaked away shovel in the remainder of the earth. The above applies to deciduous trees and vines. Continuing, Mr. Plush said it was a great mistake to plant trees too deeply. It was better to have some of the roots showing rather than to bury a tree half-way up the stem. A tree planted too deeply would never thrive, and in all probability would die through collar rot. Vines could be pruned before planting by cutting back to one bud. Deciduous and citrus trees were better pruned after planting. If pruned before, the buds left to grow might be broken in planting. In pruning deciduous trees it was advisable to have as low a crown as possible; it would be advisable to cut back to about a foot from the ground, leaving at least six or eight good buds. With citrus trees one should remove the last young growth and leave the old leaves to shade the stem and help feed the tree. For the first irrigation after planting he suggested ploughing the furrow as closely as possible to the trees or vines, so that the water could soak into the holes. After irrigating, the hoe and cultivator should be freely used, as they were just as important as the water, if not more so. The best time to plant vines and deciduous trees was during July, providing, of course, that the land was moist enough. If that condition did not obtain they could be

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set out during August, with the aid of an irrigation. September was the best month to plant citrus trees along the Murray, as autumn plantings were liable to be badly frost bitten during the winter. Trees of the citrus family should always be planted with water.

**BRINKLEY, September 10th.**—The delegates to the homestead meeting at Mr. Hudd's "Bletchley" (Messrs. H. H. Martin and E. H. Lemmey) gave a very interesting report of the meeting. Mr. E. G. Humphrey then related his experiences at the Farmers' Winter School at Roseworthy Agricultural College.

**CLANFIELD, October 3rd.**—An interesting evening was spent in discussing matters in connection with the "Take-all" investigations being carried out by the Department of Agriculture. Other items of local importance were also brought before the meeting.

**GLOSSOP.**—The Hon. Secretary (Mr. W. N. Ellis) has forwarded the following programme of meetings for the period ending March, 1922:—December 14th, address "Seepage and Underground Drainage," Mr. W. E. Muspratt; 1922, January 11, papers "Fodder Grasses," Mr. J. Hamlyn, and "The Orchard Nursery," Mr. T. Rope; February 8, address "Vegetable Growing," Mr. W. R. Lewis; March 1, address "The Citrus Association v. A.D.F.A.," Mr. L. A. Peacock. The Branch also proposes visiting Mr. Muspratt's orchard and other Renmark properties during March.

**PARILLA WELL, September 14th.**—Seventeen members were present at the meeting set aside to receive the report given by the Hon. Secretary (Mr. A. F. Young) of the conference of Pinnaroo Line Branches recently held at Parilla.

**POMPOOTA, September 7th.**—Mr. D. B. Turner read a very instructive paper, "Hints on Poultry for Beginners."

**TAPLAN, September 21st.**—The Field Engineer of the Department of Agriculture (Mr. J. Paull) attended the meeting and delivered an address, "Building Construction."

**WILKAWATT, September 10th.**—The report of the delegates to the Conference of Pinnaroo Lines that was held at Parilla on August 25th was received and discussed.

**WYNARKA, August 27th.**—The meeting was devoted to a discussion of the report given by Mr. Rackham on the Short Course for Farmers at Roseworthy Agricultural College. At a further meeting held on September 24, Mr. Richardson gave an interesting account of the Annual Congress.

## SOUTH AND HILLS DISTRICT.

### BLACKHEATH.

**September 24th.**—Present: nine members and visitors.

**THINGS THAT DO NOT PAY.**—Mr. H. G. Pym, who read a paper on this subject, first made reference to the damage attributable to the rabbit and blowfly, and urged farmers to co-operate and do all in their power to endeavor to minimise the losses caused by these pests. In the keeping and rearing of stock, the farmer's aim should be to raise animals of the highest possible standard. It was not a paying proposition to use worn out and obsolete machinery. The farm plant was a large and expensive item in the successful working of the holding, and it was imperative that the farmer should care for the machines and implements, by periodical overhauls and proper housing accommodation. The land should be kept as free as possible of stones and stumps so that breakages to the machines would be reduced to a minimum. A programme of meetings for the concluding three months of the year was then compiled.

## CYGNET RIVER.

September 22nd.—Present: five members.

Mr. H. W. May contributed a paper, "Weeds that are Troublesome on Kangaroo Island." The first weed mentioned, convolvulus, although having been noticed in a few places only, was very bad. The writer considered the only method of dealing with it was to smother it from the air. For the eradication of sorrel he suggested an application of lime to the land and to cultivate the field on the hottest days in summer. It was mentioned that that treatment had been advised by the Director of Agriculture, Professor Perkins, and it was giving excellent results. The writer referred to soursofs, which were very troublesome on land cultivated for cropping. Members did not think the soursofs would do much harm in the orchards, but in adjoining lands used for hay crops, &c., a good deal of trouble was likely to be experienced.

## GUMERACHA (Average annual rainfall, 33.30in.).

September 12th.—Present: Six members.

**OVER-PRODUCTION.**—The following paper was contributed by Mr. C. Jamieson:—This is a subject which we hear mentioned occasionally, and one, which at first glance, might be said to be of supreme importance to producers at the present time, but, however, on fully analysing the question, I have come to the conclusion that Australia has not much to fear from it at least during the next few years. To the contrary, we are up against a great financial crisis due almost entirely to under-production. The large increase in wages in the older countries of the world has given Australia an unparalleled opportunity to obtain a hold of the world's markets, but this has not been obtained, and, in consequence of that lack of foresight and initiative, Australian industries are languishing. No doubt you will ask me what about the fruit markets at present. Well, I will admit that, perhaps of all Australia's primary productions, fruit-growing is the nearest to over-production of any. There is no gainsaying the fact the acreage of land planted with fruit trees, particularly on the River Murray during the last 15 years, has been enormous, and, perhaps after reviewing the sale of fruit during this season, one might be pardoned for being a little dubious as to the future seeing that the bulk of the trees are not yet in full bearing. Speaking more particularly of South Australia, I feel that the present economic conditions have had an enormous effect on the sale of fruit. We must not lose sight of the fact that even now fruit is regarded more as a luxury than as a necessity, hence the enormous decrease in consumption during the times of financial stringency. Given normal seasons I do not think it will be long before the supply has overtaken the demand so far as Australia is concerned. I believe that, with the awakening of the Asiatic races, there are fresh markets to be exploited, and I am firmly convinced that, it is there, rather than in European countries, that Australia in future will find her best fruit markets. The wool market, which is not particularly promising at present, is carrying a large surplus at present, but that will soon be disposed of to buyers. We must not close our eyes to the fact that thousands of woollen mills cannot be turned into ammunition factories, &c., for four or five years without seriously interfering with trade in woollen goods. Even allowing that we cannot get away from the fact that Merino wool, which forms the bulk of Australian wool, is selling at prices equal to prewar rates, Crossbred wool has slumped considerably, but when the Continental mills are again working in full swing, the demand for this class of wool will increase. On the question of wheat, meat, and dairy produce I need not say much, because the scarcity and high prices of these commodities during the last year or two is quite sufficient evidence that stocks are below normal. With the exercise of a little foresight and commonsense in the management of the sale of primary products, I do not foresee any serious danger of over-production in Australia.

## HARTLEY (Average annual rainfall, 15in. to 16in.).

September 7th.—Present: 11 members.

**FARMING IN THE MALLEE.**—In the course of a paper dealing with this subject Mr. H. J. Hartley said the first work in connection with a scrub block was the knocking down of the mallee. That was best performed with a scrub roller and

five horses. In heavy mallee it was advisable to have a man working ahead to nick the big timber and to throw out all rough snags to prevent the horses from getting staked. The rolling should be performed between August and September in order to allow the timber to become thoroughly dry for burning. He suggested burning towards the end of February so as to retain as many of the ashes as possible. Ploughing at a depth of 2in. could be started after the first rain. For the first crop he would sow oats at the rate of 2bush. per acre with about 40lbs. of manure. By sowing oats one was more likely to get enough stubble for a good burn the next year to destroy as many of the shoots as possible. The second season the land should be sown with 1bush. of wheat and 60lb. of manure to the acre. After the crop had been taken off, the stock should be kept out of the paddock and the straw knocked down so as to ensure another burn. For the third year he suggested a wheat crop sown with 100lbs. of manure. The land should then be left out for two years and then fallowed not more than 3in. deep and subsequently cropped every third year. For harvesting he favored the stripper because it enabled one to save the cocky chaff. The chaff could be stored in heaps and covered with straw, and would keep in good condition for a number of years. The writer finally suggested leaving clumps of timber in different parts of the property for shelter for stock. An address "Testing Dairy Cows" was then given by Mr. J. M. Hudd.

#### LONGWOOD (Average annual rainfall, 37in. to 38in.).

August 20th.—Present: eight members and visitors.

A visit of inspection was paid to Mr. R. H. Lewis's homestead, particular interest being taken in the pruning that was being conducted in a young orchard. The formal business of the meeting was devoted to a discussion of matters in connection with the forthcoming Conference of Hills Branches.

An interesting homestead meeting was held at Mr. E. W. Beythein's "Glenholm" Poultry Farm on September 17th. After an inspection of the birds and the incubator and brooder houses the meeting was devoted to a discussion of the arrangements in connection with the forthcoming Hills Conference.

#### MEADOWS (Average annual rainfall, 35.52in.).

August 17th.—Present: six members.

ROTATION OF CROPS.—"Every farmer should have a system of crop rotation" was the opening statement of Mr. Nottage in a paper on this subject. Continuing, the speaker said no hard and fast rule could be laid down as conditions varied, and the farmer should study his soil, and by various experiments learn from experience how the best results could be obtained. He had adopted the following system of rotation:—First year, field peas; second, hay crop, and then two years grazing. He also believed a flock of breeding ewes to be an absolute necessity to ensure the fullest return from that system. The paper then read as follows:—Field peas require the land ploughed to a depth of 6in., with 2½bush. to 3bush. of seed to the acre and a good dressing of manure. Harrow the ground well, both before and after the drill. When the crop is ripe, the lambs and surplus sheep can be turned on the peas. It is also necessary to provide a grass paddock. The returns obtained from the sale of the lambs fattened in this manner I have found highly satisfactory, while the droppings from the lambs enrich the soil for the hay crop the following year. Any surplus straw left on the ground can be raked up for bedding or burnt. For the hay crop, I prefer shallow ploughing, say, 3½in., and I am convinced that the hay plant does better if it has a firm seed bed at not too great a depth. Cross drilling half the grain each will give the best results. The year following this—the land being under grazing—as soon as rain falls, I sow oats lightly over the ground and then cultivate over this and one is able to obtain good grazing pasture. During the last few years pea crops have not been very satisfactory in this neighborhood, and I am forced to the conclusion that some fertiliser required by the pea plant is lacking in most of the supers on the market. A change of manure from one year to the next will give beneficial results.

At a further meeting, held on September 21st, the Hon. Secretary (Mr. H. B. Michellmore) brought before members the paper read by the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S.) "Some Observations on Varieties of Oats and their Cultivation in South Australia," and an interesting discussion followed. Mr. Smith tabled a fine sample of Purple Top swede turnip.

#### MILANG.

September 10th.—Present: 29 members.

**CARE OF HARNESS.**—In the course of a paper dealing with this subject Mr. G. E. Scott said new harness, before being used, should be well greased in a preparation of 1gall. of neatsfoot oil to 6lbs. of suet. The harness should be dressed before ploughing and again before harvesting. When the stitches became broken in any part of the harness it was far better to have it repaired with a thread and needle rather than to try to fix it up with a copper rivet or a piece of wire. The collars should receive careful attention because they were the main part of the harness for working horses. It was a mistake to cut the collars. When they started to rub the horses a much better plan was to get a piece of round wood and beat the lining back into the shoulders, or one could shift the draught of the hames to miss the sore parts. Another good plan was to put a block of wood under the hame hook, or work the horses with wider spreaders. The steel trace chains required just as much care as leather traces. He had seen horses very badly cut along the ribs through the chains having been left out in the weather to corrode. A little oil rubbed over them twice a week would keep them free from rust. Wider spreaders could also be used on the traces instead of wrapping sheep skin or bagging around them.

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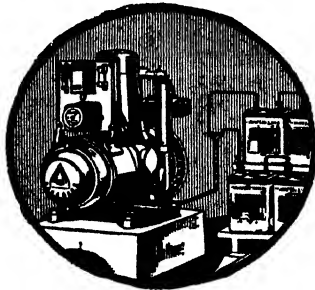
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**MOUNT BARKER (Average annual rainfall, 30.93in.).**

September 14th.—Present: 53 members and one visitor.

**ORGANIZATION ON THE FARM.**—The following paper was read by Mr. Henderson. I propose to divide the subject under these two headings:—(a) Internal—Management and economy. (b) External—Selling and buying. In the first place it is understood that the following remarks apply chiefly to farms employing two or more hands. Certain general principles, however, apply whether the farmer employs twenty hands or does everything himself. First of all comes the necessity for methodical apportionment of tasks. Only too frequently we see men waiting to be told what to go on with. There should be no waiting for instructions; each job should be mapped out well in advance, and each man should know his place in the job. Where several men are employed the farmer should quickly gauge the ability and temperament of each, and so far as possible give each man a task at which he will exert the maximum of efficiency and effort. Frequently—too frequently—we hear complaints about the men of to-day. Close observation leads one to believe that far too many men are badly led. I have seen good men sweating their lives away without visible result so far as their work is concerned; working from early morning to late at night, and nothing worth showing at the end of the year. The reason has almost invariably been faulty methods and waste of time on unessential things. If more than one man is employed, set each man to do the same portion of the little odd jobs that must be done each day, such as feeding horses, cows, pigs, fowls, cleaning stables and pigsties, milking, &c. Let every man know at least a day before what he has got to do on the morrow, so that he will know what is ahead of him. While on this point I shall be pleased to break a lance with those people who treat their hands only as a means of revenue. Your farm hands are, or should be, your friends; they should be made to understand that their employer is their ally and not their enemy. They should be taken largely into their employer's confidence, especially as to the plans for future improvements on the farm. Frequently, if so treated, they will offer valuable time and money-saving suggestions, and above all they will begin to feel real interest in their work. In sickness a little sympathy is much appreciated, but too seldom given. A bonus after a prosperous season likewise meets with approval. With these few remarks on the personal equation on the farm as the most important feature, I turn to the next, viz., "Labor saving and up-to-date machinery." While on the word "labor-saving" I wish you to understand that I am not one who wishes to displace men by machines; but I have noticed that where labor-saving machines are used bigger areas and larger production eventually result. This does not necessarily imply the employment of less men, but generally more. Wherever it is possible to employ power machines, they should take the place of horses. I refer more particularly to road traction, pumping, chaffcutting, and the like. With motor traction markets are brought nearer, and the immense saving of time and labor makes the initial cost a good investment in a very short while. On this matter I speak from actual practical experience. Machinery is being developed to a high pitch of perfection, and no farmer can afford to waste time on obsolete implements. For example, as a fruitgrower, I can testify to the great saving of time resulting from the purchase of a motor sprayer. Instead of three men, two men do the work with ease and efficiency. The time is cut down by two-thirds at least, and the economy and efficiency of the spray I should estimate is greatly increased. Summarising the internal management, then, we have:—(1) Regularity and generally methodical layout of the work. (2) Fit each man into his right place if possible to find one; if not, get another. (3) Organise your men into a band of helpers and friends—show them that your interests are also theirs. (4) Use power and up-to-date machinery wherever possible—remembering that if the outlay is a heavy drain it is an ultimate economy. (5) Lastly and a very important feature, too, is the need for accurate observation accompanied by methodical notation of events touching the crops and animals. Signs of the weather, the movements of ants and birds; in short, anything which seems to portend changes of weather, and early or late seasons. The farmer, like everybody else, likes to buy in the cheapest and sell in the dearest market. If he is to attain this happy consummation he must be possessed of extraordinary acumen and a means of information generally denied to the rank and file. Such a farmer is either like the great auk, extinct, or so like a needle in a haystack, that he cannot be found. What we are dealing with is the

best way for us to go to work to win a competence for ourselves and our children. Co-operation amongst the farmers of a district is not perhaps a panacea for all the ills a farmer's flesh is heir to, but it goes a long way to cure that lonely deserted feeling that long distances from markets and so-called civilisation sometimes bring about. Organisation of the sale and distribution of the farm produce is the next most important thing after growing it. The need for close scrutiny of markets and market prices is apparent to all, and where a number of farmers co-operate in the marketing of their produce they are better able to put up a fight against starvation prices than the individual with a small parcel of produce, and no cash. We fruitgrowers in this district have tried co-operation in a limited sense by erecting a little cold store at Balhannah. This is our first season, and I for one can testify to the great benefit it has already been to me. Butter factories, Co-operative Milk Producers' Associations, and the like are springing up all over Australia, and while they may have their trials and tribulations they have their successes, and if the New Zealand figures be any guide they have been of incalculable value to their farmer shareholders. A number of men banded together for a common purpose can buy the necessary brains for business management where



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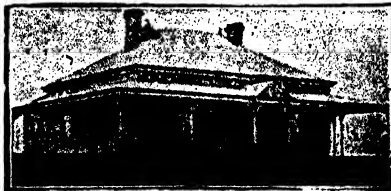
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one farmer could not. Therefore, in buying and selling, the farmers of each district should meet often, compare notes, and eventually form the basis of a little guild for the dissemination of all information likely to benefit each and all. Eventually they will have to appoint a secretary (not necessarily a farmer), and then it will not be long before they are a co-operative company, or part of a larger one. I said that I did not regard co-operation as a panacea for all farmers' troubles. It is not. Properly managed, a co-operative company is a benefit to all concerned; with bad management, it is the reverse. Practice has demonstrated that all co-operative companies, whether farmers, fruitgrowers, or otherwise, are governed by the personal equation. Good management indicates success to all; bad management in co-operation, as in all things, means eventual ruin. It is not always possible for a farmer to get his neighbors to co-operate with him, and I often notice a tendency to keep a good thing to oneself. I am afraid that is a habit which dies hard, but die it must. All must realise that Australia is a great Commonwealth, that increased production to pay our debts is essential, and that he who withholds information of value from his fellows is injuring the Commonwealth and eventually himself. It is a case of get together, pull together, and rise together to a pinnacle of eminence worthy of a great country, or go down into the morass of repudiation and decay. A splendid cabbage, weighing 18lbs., was shown by the grower, Mr. J. Bunnett, of Wistow, and Mr. W. Henderson had on view a nice collection of apples, just taken out of cool storage. These looked as if they had been only pulled off the tree that day. A hearty vote of thanks was accorded Mr. Henderson, on the proposition of Mr. W. Stephenson.

#### ROCKWOOD.


September 19th.—Present: 21 members and five visitors.

**TOMATO CULTURE.**—In the course of a paper dealing with this subject, Mr. H. E. Green said that the seeds should be sown from June until August, and when large enough the plants should be transplanted. For the protection of the young plants from frosts he suggested the following plan:—Cut a kerosine tin in halves from corner to corner and steady it with a stake. This should be placed over the plants. If a piece of glass is placed in front of the tin, an improvement will be effected. After the nights commence to get warm, the glass can first be removed and later on the tins can be taken away. Continuing, the speaker said tomatoes could be grown on a variety of soils and a good plan was to plant the early varieties on a sandy soil, and the later crop on land of a heavy nature. The land should be deeply ploughed, worked down to a fine tilth with the harrows, and finally made firm with a roller. Those operations should be performed about a month before planting time, when the land should again be worked with the cultivator. When setting out, the plants should be taken from the seedbed, the leaves trimmed back, and then stood in water for a half an hour. If that was done the plants would not wilt when they were set out. He suggested planting dwarf varieties in rows 4ft. apart with 2ft. between the plants. For the larger bushes the distances could be increased to 4ft. 6in. and 3ft. respectively. If one planted in the form of a diamond, a horse cultivator could be worked between the rows, and a considerable amount of hoeing would be saved. For manuring the land he suggested two applications of bone super., 2½cwt. to be harrowed in before planting and 2½cwt. to be used as a top dressing at the time of the second cultivating. If stable manure was used, it should be ploughed into the land the year before, as fresh manure was inclined to make too much foliage on the plants. The tomatoes would not require a great deal of water until the first fruit showed signs of setting, and, at that stage, they should be freely watered. An application of liquid manure, made by dissolving a handful of sulphate of ammonia or nitrate of soda in a kerosine bucket of water, would help the plants along. Early Dwarf Red, John Baer, Burpee's Matchless, and Livingstone Magnus were the varieties favored by the speaker. The tomatoes should be picked so soon as they began to show color, and, if one intended harvesting the fruit for market, it was best to grade and pack the cases carefully. Regarding the saving of the seed, the speaker said he always made a practice of going through the beds and picking the best

fruit from the healthiest bushes. The cut worm was the worst pest that the tomato grower had to fight. The best method of destroying it was to mix 2ozs. of Paris green with 3lbs. of bran and a little sugar or treacle, and place the baits around the plants in the evening. Caterpillars were also responsible for a good deal of damage, and these could be combated by spraying the bushes with 1lb. of Paris green to 200galls. of water when the fruit was very small. Finally, one should not make a practice of growing crops of tomatoes for two years in succession on the same piece of land.

ASHBOURNE, September 29th.—Messrs. W. H. Cuming and R. H. Haines, delegates to the Annual Congress, gave a full and detailed account of the proceedings of the gatherings. On September 20th members of the Branch attended a meeting of the Strathalbyn Branch, when papers were contributed by Messrs. Potter and Sissons. This interchange of papers from neighboring Branches of the Bureau is a somewhat novel idea and is one well worth trying by other Branches.

BALHANNAH, August 19th.—An interesting address, "Stud Stock," was given by Mr. E. W. Mattner, the speaker relating some of his experiences during visits to stud stock farms in England while with the A.I.F. At a further meeting held on September 16th, Mr. A. Filsell contributed a paper "Fruit Growing," and an interesting discussion followed.



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CHERRY GARDENS, September 13th.—Mr. A. R. Stone, who attended the Short Course for Farmers at the Roseworthy Agricultural College, gave an interesting report on the lectures and addresses given by the officers of the Department of Agriculture.

CLARENDON, August 14th.—An interesting report of the Winter School for Farmers, recently held at Roseworthy Agricultural College, was given by Mr. D. R. Spencer.

HARTLEY, July 20th.—Mr. D. F. Westwood contributed a paper "The Humane Treatment of Farm Stock." A very strong plea for greater care and more kindly and thoughtful treatment of all animals on the farm was made in the paper. The Hon. Secretary (Mr. W. B. Hudd) read the annual report and the election of officers for the ensuing year took place.

IRONBANK, August 21st.—The meeting was devoted to a further discussion on the proposed erection of an evaporating plant. At a further meeting held on September 24th three papers from the *Journal of Agriculture* were read and discussed.

MORPHETT VALE, September 22nd.—The Chairman (Mr. A. Anderson) gave a full and detailed report of the proceedings of the Annual Congress, prominence being given to the following subjects:—Afforestation, oats, and veterinary surgeons for outlying districts.

## SOUTH-EAST DISTRICT.

GLENCOE (Average annual rainfall, 33.84in.).

August 26th.—Present: 26 members and 24 visitors.

SUGAR BEET GROWING.—In the course of an address on the subject Mr. J. Livingston, M.H.R., intimated that his address was the commencement of a vigorous campaign to establish a beet sugar factory in the South-East. After universally studying the question he was thoroughly convinced that there was no better country in the world for the production of the beet than that lying along the coast between Kingston and Warrnambool. He furnished information regarding cultivation and production at Maffra, stating that from experiments carried out locally, the proposition would be even more profitable in the South-East. Samples of sugar derived from local beets were distributed, in corroboration of the speaker's remarks. Convincing results of the address were evident in the immediate offer of the members to cultivate at least 114 acres of the 4,000 required for the establishment of a Government factory. Mr. Davison, of Mount Gambier, also entertained the meeting on the subject, and said he was convinced that the project would be successful if taken up by the farmers generally. Mr. Livingston, in replying to Mr. S. J. Bonney, said that the best results were obtained by ploughing to a depth of at least 12in., the plants to be thinned out to 8in. apart in the rows, the distance between the latter to be 18in. Mr. S. J. Bonney asked what period elapsed between the planting and pulling of the beet, the reply being eight months, viz., from October to May.

LUCINDALE (Average annual rainfall, 23.32in.).

October 1st.—Present: seven members and two visitors.

EUCALYPTUS DISTILLING ON KANGAROO ISLAND.—In the course of a paper dealing with this subject Mr. P. Hunt said the digester, or vat, was usually made from an old iron boiler shell, circular in shape, and as a rule 6ft. deep and 6ft. in diameter. In most cases the distillation process was carried out by direct heat. Water was placed in the digester to the extent of about one-sixth of its holding capacity. The leaf was then put in and tramped in as tightly as possible until the digester was full. The lid was then firmly fastened down to prevent the escape of steam, excepting through the pipe that connected the digester and

condensor. The water in the cylinder was then brought to boiling point and the steam thus generated passed through the leaf, thereby extracting the oil, from thence it passed on to the condensor. It next entered a receiving can which contained a syphon pipe for drawing off the water. The water condensed with the oil, and the latter remained in the receiving can until drawn away by the distiller. Formerly either copper or lead coils, contained in a tank full of water, were used for condensing, but in the majority of cases at the present time, iron piping, in long stone troughs, was used and found to be quite satisfactory and more economical. The time required for distillation depended on the amount of heat and steam one was able to generate, but it usually took three hours to extract the oil from one digester full of leaves. The material used was chiefly the Narrow Leaf Mallee (*Eucalyptus Cneorifolia*). In some parts of the island a eucalypt locally known as "Peppermint" was used, and the oil analysis showed that the oil contained almost the same constituents as the narrow leaf. The cutting of the material was usually performed by contract; at so much per still. The branchlets were cut from 18in. to 30in. in length, and placed in convenient heaps in the scrub for the carters to collect and carry to the still. The distilling could be carried out during the whole of the year, but from October to April were the months during which the mallee yielded the best returns of oil.

#### MOUNT GAMBIER (Average annual rainfall, 32in.).

September 10th.—Present: 20 members.

**SUMMER FODDER CROPS.**—Mr. R. P. Pritchard, who gave a short talk on summer crops, said the first thing to be done was to get the ploughed land ready to receive the crop. Every shower of rain should be made the best use of, and the ground given a good stirring up. His own choice of crop was Sudan grass, chow mollier, sorghum, and millet. Sudan grass was a success with him last year. Although he had not more than 3 acres of it, it kept his stock going for months. When everything else was dried up in summer the Sudan grass was flourishing. He had 3 or 4 acres of chow mollier, and he thought it should be the main crop for anyone engaged in dairying. It seemed to be a sure crop. He had the land worked up nicely and the weeds reduced as far as possible. It germinated well, and he used the cultivator, and marked the plants out 3ft. apart in the rows. By that means hand weeding was avoided. A horse hoe could be used both ways and weeds were kept under. Maize was a succulent feed; the best way to use it was to chaff it with oats and bran. He had always in reserve the silo, and, if the worst came, he had to recourse to that. In reply to questions, Mr. Pritchard said he used about 6lbs. of Sudan grass to the acre. It should be sown no thicker than 6lbs. to 8lbs. The distance between the rows should be from 7in. to 24in.; it depended upon the summer they had. In a good summer 7in. would be enough. He never sowed anything broadcast as one had to keep the weeds down. Keeping the ground stirred up did an immense amount of good. Chow mollier was a succulent food and was an excellent pig feed. An interesting discussion also took place on the advisability of establishing the flax-growing industry in the South-East. Mr. H. Major tendered a report of the Winter School for Farmers that had been held at Roseworthy Agricultural College.

#### NARACOOORTE (Average Annual Rainfall, 22.60in.).

August 13th.—Present: 19 members.

Mr. H. H. Orchard (Horticultural Instructor for the South-East) attended the meeting and read a paper on "Pruning." Mr. J. M. Wray, who attended the Winter School for Farmers recently held at the Roseworthy Agricultural College, gave an interesting report of the proceedings. Mr. W. E. Rogers exhibited a bottle of olive oil which he manufactured from olives grown on his property. Mr. C. Drake exhibited some fine cauliflowers, and Mr. W. W. Gould exhibited a bunch of excellent turnips grown from seed sown in his garden. Mr. Gould also exhibited manufactured tobacco, cigarettes, and cigars from the leaf that he had grown. The latter were distributed among those present.

## RENDELSHAM.

September 14th.—Present: 16 members and three visitors.

**VALUE OF NATIVE BIRDS.**—Mr. Foster read a paper, "The Advisability of Protecting Our Native Birds." Good discussion followed, the chief birds mentioned being the starling, Derwent jackass, and sparrow. It was agreed that the starling's insect-eating propensities outweighed its appetite for fruit, and that he did more good than harm. The jackass, on the other hand, though an insect eater, feasted also upon wrens, and for that reason should be destroyed. Reference was made to the increasing number of trees being destroyed by insects and grubs, and it was thought that the birds, if abounding in greater numbers, would soon minimise the ravages of the insects. Mr. Foster suggested that as foxes were noted bird destroyers, a club should be formed for the eradication of the pest.

## TANTANOOLA.

September 17th.—Present: 10 members.

**DAIRYING.**—"I consider the three following headings, feeding, breeding, and culling the main points on which the success of the dairying industry rests" said Mr. C. Keily in a paper under the above heading. Continuing, the speaker said of the two first mentioned points one was of little use without the other. Care of the pastures was a very necessary factor if the best returns were to be obtained from the animals. For that purpose the speaker suggested the convenient subdivision of the farm so that the cows could be frequently changed from one paddock to another. Again, it was necessary that the pastures should be topped dressed once a year with lewt. of super. With a good pasture one should have sufficient grasses to carry the cows through the spring and the early part of the summer, while for the rest of the year the dairyman should provide plenty of oaten hay chaff for loose fodder. For the autumn crops the speaker suggested maize, kale, choux moullicr, Sudan grass, and mangolds. The land on which it was intended to sow the crops should be well prepared before hand. Barley and rye he considered were best to sow for cutting, while oats could be planted for feeding off. Referring to breeds he thought the Milking Shorthorn, Holstein-Friesian, and Illawarra cattle would be suitable for the South-Eastern districts. Numerous figures showing the high milk yields of famous cows were then quoted by the writer. **Breeding.**—The necessity for using a pure bred bull could not be too strongly emphasised. As regards the purchase of the cows he believed it was always best to buy a heifer on her first calf, because if she did not prove a profitable beast she could be fattened and sold. It was a good plan to give each cow six weeks or two months rest before calving, in order to give her a rest after the heavy strain during the preceding 10 months. For the general care of the herd, the cows should be milked at regular intervals, and be treated at all times with kindness. At times it was very difficult to obviate teat troubles and as a remedy the speaker suggested the following practice:—Mix 1oz. of boracic acid and 2ozs. of glycerine in a pint of water. Put the lotion into a large necked bottle and immerse the teat in it for a couple of minutes after each milking.

**FRANCES, August 27th.**—The meeting was devoted to a discussion on the best methods of destroying noxious weeds.

**MUNDALLA, September 29th.**—On the occasion of the annual meeting, the Hon. Secretary (Mr. E. D. Hodges) read the report of the work performed during the past year, and the officers were elected for the ensuing term. The Secretary of the Advisory Board of Agriculture (Mr. H. J. Finnis) was in attendance and delivered an address "The History and Growth of the Agricultural Bureau." The business of the evening was interspersed with musical and vocal items, and the meeting was concluded by a dance and supper. During the evening six new members were enrolled.

**PENOLA, October 1st.**—The delegates to the Annual Congress (Messrs. Clifford and Adamson) gave an interesting report of the proceedings of the gathering.



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# THE JOURNAL

OF THE

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### OF SOUTH AUSTRALIA.

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**All communications to be addressed:**  
**"The Editor, Journal of Agriculture, Victoria Square, Adelaide."**

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T. PASCOE,  
*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### The Sheep Nasal Fly.

The sheep nasal fly (*Oestrus ovis*) is becoming common all over the State, and quite a number of inquiries have been received in relation to the parasite. This fly lays her eggs, or, in some instances, the larvae are deposited, on the nostrils of the sheep. The tiny larvae make their way up the nostrils and locate themselves in the hollow cavities of the skull, the favorite seat being at the base of the horns cores. They remain in this situation for about ten months, when they pass out of the head, many being expelled by the act of sneezing. They pupate on the ground, and in a few weeks the adult fly emerges and the same cycle of events takes place. If the bots are few in number, the Government Veterinary Surgeon (Mr. C. A. Loxton, B.V.Sc.) says, they do not appear to cause any inconvenience; but if numerous, the irritation set up by their presence must be responsible for loss of condition.

### Poisoned Wheat for Sparrows.

The following method of poisoning wheat for the purpose of destroying sparrows has been suggested by the Director of Chemistry (Dr. W. A. Hargreaves). Ingredients:—Arsenic (ordinary commercial), 2½ oz.; washing soda crystals, 5 ozs.; boiling water, ½ gall. Stir for two or three minutes in a kerosine tin, and whilst still hot, add 20 lbs. of wheat. Again stir for about five minutes, when the whole of the liquid should be absorbed. The wheat can then be spread out to dry.

### Potatoes as Stock Food.

On page 278 of the November issue of the *Journal* the Director of Agriculture is reported to have stated that "Potatoes are milk-producing in the sense of supplying protein like bran." This should read "Potatoes are not milk-producing," &c.

### Murray Bridge High School.

The attention of farmers who have sons eligible to enter a High School is drawn to the special course of work provided at the Murray Bridge High School. In addition to a general education, such as is given by most country High Schools, scholars have the opportunity of doing special work of an agricultural nature. The aim is to give an agricultural bias to those lads who intend becoming primary producers. With this end in view the following studies are included in an elementary form:—(1) Chemistry and Botany, especially as related to agriculture; (2) Agriculture Study in simple form of soil, tillage,

water, and irrigation; (3) Horticulture—Planting, training of young trees, pruning, budding, grafting, spraying, storing, and preserving of fruit; (4) Natural Science—Value of our native birds, insect life (various stages), remedies for destructive insects, fungus diseases and spraying; (5) Milk Testing; (6) Practical work in school garden and irrigation plot.

**Scholarships**—Three scholarships are available to boys from this school to enable them to proceed to Roseworthy College.

**Board.**—On application to the Head Teacher, High School, Murray Bridge, efforts will be made to obtain suitable accommodation for boys from a distance.

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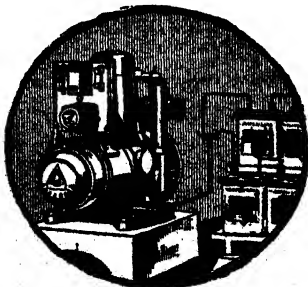
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## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"C.E.V.," Coonalpyn, reports lambs three to four months old, very stiff and unable to walk quickly. Heavy breathing is most noticeable. Death resulted in one instance and subsequently a lamb was forwarded by the inquirer to the Adelaide Hospital Laboratory where it was kept under observation for a few days. It was then killed.

Reply—The post-mortem revealed the presence of lungworm, and also a heavy infestation of minute roundworm in the small intestine. All other organs were healthy. The trouble affecting your lambs is evidently due to the intestinal worms, and the most effective treatment is a solution of sulphate of copper (bluestone). Make this by dissolving 1oz. bluestone in 6 pints of water. The dose of this solution is 1½ozs. The dose can be repeated in a week or two.

"C.R.W.," Wirrega, reports death of horse. Animal showed acute pain, rolling, and stamping his feet. Died six or eight hours after first being noticed. Post-mortem showed part of the gut to be inflamed and the food inside this portion was of a brown color, also some sand. The other organs appeared to be healthy.

Reply—I conclude that the cause of death was a twist of the bowel. This condition may not have been observed during the post-mortem. The course of the disease and the state of the bowel and contents are fairly significant.

"R.S.T.," Rockleigh, has ewe with part of the udder a dark blue color. The lamb from this ewe was given to another ewe which had lost her lamb, and after it had been sucking for a few days the udder of the second ewe also became affected.

Reply—This is a form of mastitis or inflammation of the udder. This ailment is not uncommon, especially in ewes in which the udder is well developed. The lamb may have been the means of conveying the disease to the second ewe. The success of treatment depends upon its discovery in the early stages, and in ewes the trouble is usually well established when it is discovered. Give 3-4ozs. of Epsom salts with a tablespoonful of treacle, and half a pint of water. Apply warm fomentations frequently, and milk out the affected side frequently.

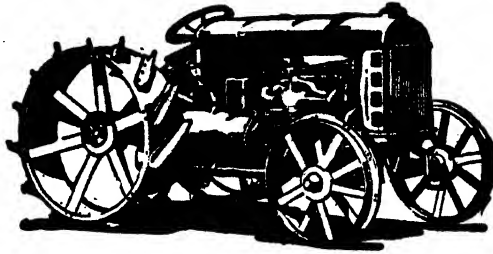
"E.M.W.," Yallunda Flat, reports cow rolling head from side to side. After lying down has difficulty in rising. Stiff in hindquarters.

Reply—I recommend you to give her powdered nux vomica, half a flat teaspoonful mixed with a little treacle and given on the tongue twice daily. It would be advisable to supply your cows with salt and bonemeal, 1oz. of each given in the feed daily, or in the form of a lick by mixing the ingredients in equal parts. Use bran liberally in the ration.

"A.A.C.," Streaky Bay, has mare five years old, refused feed and shivered violently. Post-mortem showed heavy yellow matter about the intestines.

Reply—It would appear the mare died of peritonitis as indicated by the matter about the intestines and liver. Peritonitis is often secondary to some other condition, probably in this case abscess formation in the liver.





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"W.H.G.," Glynn, reports death of heifers. Animals stand very stiffly on all four legs and often by getting down unable to rise.

Reply—This disease, in which stiffness followed by inability to get up is a prominent symptom, is commonly called progressive paralysis. The treatment of affected animals is not satisfactory. Preventive treatment consists in the provision of a liberal ration. Your cattle will require hand feeding. Give them plenty of bran. Supply also equal parts of salt and bonemeal in the form of a lick, or give loz. of each in the feed twice daily.

"G.H.W.," Tarcowie, has draught gelding which moves towards the off side during progression.

Reply—The condition is probably nervous in origin and unlikely to respond to treatment. You might, however, try a tonic such as:—Powdered nux vomica, loz.; powdered gentian, 4ozs.; mix. Give one teaspoonful twice daily in the feed.

Hon. Secretary, Agricultural Bureau, Mancoora, reports death of calf two months old. Wandered aimlessly about and appeared to be blind as it was constantly walking into different objects.

Reply—The cause of death was gastritis (inflammation of the fourth stomach), which is very often due to errors in feeding. If recognised early give Epsom salts loz., soda bicarb., ½oz., ginger half teaspoonful, lukewarm water half pint. Give also a wine glassful of lime water in each feed. If constipation is present, give in addition two or three ounces of castor oil.

"O.J.L.," Kooringa, has 12 year old mare with discharge from near side eye; also grey mare with large swellings on the tail and ribs.

Reply—Bathe the eye daily with warm boracic lotion made by dissolving a tablespoonful of boracic acid in a quart of water. The swellings on the tail and ribs of the grey mare are a form of new growth common in horses of this color. You will find that on section they contain a quantity of black pigment. The only treatment is surgical removal. Work her while she maintains her health and condition and then have her destroyed.

"E.F.N.," Mount Compass, reports stiffness of the forequarters of heifers a few months after calving.

Reply—The trouble is probably diet deficiency. Feed them liberally. Supply them salt and bonemeal in the form of a lick, or, if they do not take it in this manner, give loz. of each twice daily with bran and chaff.

"B. Bros.," Borrika, report horse "cut proud" worrying mares; also mare with hard swelling on shoulder.

Reply—It would be advisable to keep this horse away from the mares after they have been served by the stallion. The straining caused by his attention is certainly harmful. You may blister the shoulder of the five year old mare. Use red blister made by mixing one dram (½oz.) of red iodide of mercury with loz. of lard. Apply this by rubbing in well over the swelling for five minutes. Tie her head up short for an hour after blistering. Keep her under observation for a week or so afterwards in case the blister causes the formation of an abscess. If this occurs, keep clean, dress daily with antiseptic solution. If abscess formation does not take place it will be necessary to put her out of work until the swelling disappears.

"W.F.H.," Cleve, has pony with a punctured wound on the outside of the knee.

Reply—Cleanse the wound daily and syringe with peroxide solution. Give the leg plenty of cold water irrigation from the knee downwards. Severe injuries to the joint are always refractory to treatment. Keep her as quiet as possible and give her mash twice or three times a week and plenty of green stuff if you can obtain it.

"J.C.W.," Murray Bridge, has pony with a yellow discharge from the eyes and swelling of the eyebrows.

Reply—Bathe the part daily with warm disinfectant lotion made by dissolving one tablespoonful of boracic acid in a quart of water. If the eyes are sensitive to light you should protect him from the bright sunlight.

"R.S.T., Rockleigh, has young heifer lame in the fore leg, and a swelling above the knee.

Reply—Keep her in a small yard so that she cannot move about much. Foment the swelling if there is any heat or pain in it. The hollow close to the shoulder bone is probably due to wasting of the muscles from disuse.

"W.G.H., Jabuk, has first foal with swelling under the belly, which has been scouring and falling away in condition since foaling.

Reply—The swelling under the belly is due to debility, but the cause of her condition is not apparent. The Fowler's solution is a good tonic, but I would suggest that you substitute nux vomica. Give her half a teaspoonful of the powdered nux vomica, or a tablespoonful of the tincture mixed with a little treacle on the tongue once a day. Feed her well and give her a little green stuff every day if it is procurable.

"P.B.," Lucindale, has 9½ year old mare with large swelling on right side of the wither.

Reply—She has had an injury in the region, which will probably develop into a fistula. If the abscess has not broken you should open it. Make an incision in the swelling in such a manner as to provide for drainage. Keep the wound clean and syringe it out daily with some disinfectant solution, such as one part of carbolic or izal to 40 of water. If a fistula has formed it will require thoroughly opening up and subsequent daily dressing as above.

Hon. Secretary, Agricultural Bureau, Kingscote, reports draught mare, 8 years, passing blood with urine; breathing heavy; stiff in hindquarters.

Reply—She should be given a dose of raw linseed oil (1 pint), light laxative diet, plenty of bran mash, boiled linseed, and linseed tea, and bicarbonate of soda, half an ounce, twice daily in feed or drinking water.

Hon. Secretary, Agricultural Bureau, Kilkerran, asks whether a sow having 10 young ones would have the same quantity of milk per head as she would have if she had only five, and at what age should a young sow be put to the boar.

Reply—(1) Weaning should take place at from six to eight weeks. The period depends upon their development. Take away the strongest ones first and leave the smaller ones with the sow for a week or so longer. (2) The sow would have the same supply of milk at farrowing irrespective of the number in the litter, but as the requirements of a small litter would be correspondingly less she would soon secrete milk accordingly. (3) It is best not to put the sow to the boar until she is 10 or 12 months old.

"A.B.M.," Monash, has four year old gelding which groans while passing dung.

Reply—The probable cause is constipation, though it may be partly habit, or an individual peculiarity. Attention to the diet should be all that is necessary.

"H.B.," Coomandook, reports mare with a wound discharging profusely on the front of the hock.

Reply—She has an open joint, an injury of a serious nature, which may have permanent after effects. Syringe it out with hydrogen peroxide 1 part, cold water 3 parts, two or three times a day. Give leg plenty of cold water irrigation by running the hose on it from the hock downwards. Dust the wound with pure iodoform after irrigation. Put her in a comfortable loose-box and keep her quiet. Supply light laxative diet, mashes, and green stuff.

---

"A. A. E.," Biggs Flat, asks what artificial manures are most useful for potato growing in dark gully soil that is deficient in lime; also whether it would be advisable to apply air-slacked lime in conjunction with artificial manures.

Reply by the Superintendent of Experimental Work (Mr. W. J. Spafford)—Apply up to 10cwt. of lime before furrowing out for potatoes, then apply 5cwt. to 8cwt. superphosphate per acre in the rows. For results of tests with manuring of potatoes at Mount Barker see *Journal of Agriculture* for July, 1921, page 1002.

## DEPARTMENTAL DOINGS.

### GENERAL AGRICULTURE.

Places visited by the Director of Agriculture (Professor Arthur J. Perkins) during the month of November include Kuitpo Forest, Roseworthy Agricultural College, Kybybolite Experimental Farm, Penola, Kongorong, Mount Gambier, and Tantanoola. The Director addressed a meeting of the Nurserymen's and Seedsmen's Association.

### BUILDINGS, ETC.

On November 17th the Field Engineer (Mr. J. Paull) visited Mr. Smith, of Mount Barker Junction, in connection with the erection of farm buildings. On the 18th Messrs. Green and Mountstephen, of Monteith, were visited and advised on erection of dairy buildings. A visit was paid to Mr. T. W. Sobels, of Watervale, on the 24th regarding the erection of a stable, chaffhouse, &c., for 24 horses. Plans for a seven-roomed residence were also forwarded to Mr. F. Johnstone, of Wudinna, Eyre Peninsula.

### HORTICULTURE.

The Horticulture Instructor (Mr. Geo. Quinn) on the 8th of November addressed the members of the Barmera Branch of the Agricultural Bureau and inspected the experimental cotton plots of the Irrigation Department at that centre. On the 9th Berri and Monash were visited in connection with disease of grape vines. An address, "Fertilisers," was delivered before the Renmark Bureau on the 10th. Mr. Quinn also inspected vines which last year were affected with downy mildew, but he reports that this year no traces of the disease could be found. Burra and the surrounding districts were visited on the 17th and 18th in order to study the locust plague. Orangeries in the Inman and Hindmarsh Valleys and the Port Elliot districts were visited on the 28th, 29th, and 30th.

### DAIRYING, ETC.

During the month the Assistant Dairy Expert (Mr. H. J. Apps) delivered a lecture before the Mount Barker and Rockwood Branches of the Agricultural Bureau. Dairy farms in the Blakiston, Black Swamp, and Finnis districts were also visited, and the Nuriootpa butter factory was inspected.

### GENERAL.

Members of the Advisory Board of Agriculture visited the Roseworthy Agricultural College on November 9th, and on November 23rd inspected the Government Experimental Farm at Kybybolite. A number of representatives of South-Eastern Branches also took the opportunity of inspecting this farm on November 25th. District tours were held by several Branches in the South-East. These were attended by officers of the Department. The Branches concerned were:—Penola, Kongorong, Tantanoola, and Mount Gambier.

Capt. S. A. White, C.M.B.O.U., a member of the Advisory Board, delivered addresses at Penola, Kongorong, Millicent, and Glencoe.

## SUMMER FODDER ON SANDY LAND.

To a correspondent, who intimated that he held an area of sandy country in the vicinity of Murray Bridge, who required information respecting some fodder that would keep green through the summer or provide feed after the native grasses had gone off, the Superintendent of Experimental Work (Mr. W. J. Spafford) wrote:—

The only fodder plants that I know of, likely to grow at all well on your sandy land, are lucerne, cereals, King Island melilot, and Wimmera rye grass, but of these, the only one that can be classed as a summer forage crop is lucerne.. You will get greater satisfaction from lucerne in your particular conditions than from any other crop I know, provided that it is handled in the best manner. I would suggest that the following method be adopted.

1. Divide up a part of your holding into six approximately equal-sized fields. (Grazing lucerne cannot be handled properly unless in small fields.)

2. Bare fallow one of the six fields each year.

3. Sow a cereal hay crop on the fallowed land.

4. As soon as possible after harvest time, work up the hay stubble—a cultivator will do it just as well as the plough if handled carefully.

5. Immediately following the first rain which falls after March 1st, broadcast 6lbs. to 10lbs. of lucerne seed per acre on the cultivated stubble and roll the land to cover the seed. If the land has started to drift after cultivating the hay stubble, do not roll, but cover the seed with a brush harrow made by tying branches together.

6. This lucerne will be left for four years before the plot is bare fallowed.

Under this system, one of the fields will be fallowed each year, one seeded with cereals for hay (rye and early oats in equal proportions would make good hay), and one seeded with lucerne, and the remaining three would be used as lucerne pasture. Such a cropping would need to be done in regular order, and would be somewhat as follows, taking it that you have numbered the fields from 1 to 6.

	1922.	1923.	1924.	1925.	1926.	1927.
Field No. 1 . . .	Fallow	Hay	Lucerne (Seeded)	Lucerne	Lucerne	Lucerne
Field No. 2 . . .	Hay	Lucerne (Seeded)	Lucerne	Lucerne	Lucerne	Fallow
Field No. 3 . . .	Lucerne (Seeded)	Lucerne	Lucerne	Lucerne	Fallow	Hay
Field No. 4 . . .	Lucerne	Lucerne	Lucerne	Fallow	Hay	Lucerne (Seeded)
Field No. 5 . . .	Lucerne	Lucerne	Fallow	Hay	Lucerne (Seeded)	Lucerne
Field No. 6 . . .	Lucerne	Fallow	Hay	Lucerne (Seeded)	Lucerne	Lucerne

If you did decide to try such a system of farming for your sandy land, the first year's cropping, as shown above for 1922, would not be quite as set out, because it would hardly pay to sow lucerne for one year's grazing, or perhaps not for two years' grazing, and the easiest way to commence would be to alter the first two years as:—

	1922.	1923.	1924.
Field No. 1 . . . . .	Fallow	Hay	
Field No. 2 . . . . .	Hay	Lucerne (Seeded)	
Field No. 3 . . . . .	Lucerne (Seeded)	Lucerne	As shown above
Field No. 4 . . . . .	Lucerne (Seeded)	Lucerne	
Field No. 5 . . . . .	Hay	Pasture	
Field No. 6 . . . . .	Pasture	Fallow	

With such a rotation conducted on fields 20 acres in extent, each year you would have on that part of your farm:—

20 acres fallow.

20 acres hay.

20 acres lucerne just seeded.

60 acres lucerne (in three fields).

The hay crop should receive at least 1cwt. superphosphate per acre, and the plot to be seeded with lucerne should have 1½cwt. to 2cwt. superphosphate drilled in before the seed is broadcasted.

## IMPROVING THE WHEAT CROPS ON YORKE PENINSULA.

[By W. J. SPAFFORD, Superintendent of Experimental Work.]

During November 22nd to 24th, 1921, Mr. F. Coleman, of Saddleworth, and the writer judged the wheat crops entered in the Yorke Peninsula "Suntynne" Combined Drill and Cultivator Competition. These crops, each consisting of 100 acres, and in no case comprised of more than three varieties, were judged to the arranged scale of points—(a) apparent yield; 65 per cent.; (b) trueness to type and purity, 5 per cent.; (c) freedom from diseases, 10 per cent.; (d) freedom from defects, evenness, condition, and appearance, 5 per cent.; (e) cleanliness, 15 per cent.—with the following results:—

DETAILS OF CROPS.										DETAILS OF JUDGING.—POINTS AWARDED.				
Competitor's Name (in order of Merit).	Address.	Position.	Total No. of Crops Grown on Field.	Present Crop Sown on	Date of Seeding.	Amount of Seed. Lbs.	Amount of Manure (Super). Lbs.	Variety.	Apparent Yield.	Trueness to Type and Purity.	Freedom from Disease.	Freedom from Defects, Evenness, Condition and Appearance.	Cleanliness.	Total.
Greenlade, S. . .	Urania. . . . .	1	17	Fallow	20/6/21	80	112	Major . . . . .	65% 65	5% 3.5	10% 8	5% 5	15% 14.5	100% 96
Goldsworthy, H.	Curramulka .	2	8	Fallow	25/6/21	60	112	Late Gluyas, Currawa	47	4.5	9	4.5	13	78
Greenlade, A. .	Maitland . . .	3	20	Fallow	1/7/21	75	75	Federation . . . . .	48.5	4	8	3	13	76.5
Heinrich, C. F. G.	Kilkerran . .	4	—	Fallow	1/6/21	70	90	German Wonder .	44	4	8	4	14	74
Greenlade, G. L.	Maitland . . .	=5	20	Fallow	27/6/21	75	75	Federation . . . . .	45.5	4	8	4	11	72.5
Polkinghorne, J.	Curramulka .	=5	4	Fallow	25/6/21	60	112	Late Gluyas, Federation, Currawa	45.5	2	9	4	12	72.5
Brown, D. E. . .	Maitland . . .	7	15	Fallow	1/6/21	60	85	Belgium Wonder, Federation	40	4.5	5.5	4	13	67
Coleman, S. K. .	Maitland . . .	=8	15	Fallow	4-12/6/21	60 78	— 90	Major, Federation	38.5	4	5	4	12	63.5
Haesting, L. E. .	Sth. Kilkerran	=8	20	Fallow	15/5/21	60	100	Nugget Major . . .	35	4	6.5	4	14	63.5
Agnew & Sons .	Curramulka .	10	14	Fallow	25/6/21	60	112	Currawa, Late Gluyas	29	4.5	8	4	14	59.5
Gersch, J. C. . .	Curramulka .	11	9	Fallow	25/6/21	70	100	Smootproof . . . . .	29	4.5	9	3	10	55.5
Tippett, G. L. . .	Maitland . . .	12	15	Fallow	1/6/21	70	100	Red Russian, Currawa	30	3.5	3.5	4	13	54
Kelly, Ray . . . .	Maitland . . .	13	16	Fallow	4-14/6/21	75	112	Nugget . . . . .	31	4	6	2	10	53

## THE COMPETING CROPS.

1. *Mr. S. Greenslade—Urania (Major)*.

This crop, grown lower down the Yorke Valley than the others and on apparently richer and consistently even soil, was, as the very high marks of 96 out of 100 show, on the day of judging, an extremely creditable exhibit, and for this particular season was almost perfect. In any year a similar crop of wheat in this district would score a very high percentage of the marks allotted for "apparent yield," and we consider that the crop now promises to yield all that could be expected in such a season as the present one has proved to be. Although the main crop of "Major" was comparatively true to type, carelessness in allowing a butt of another variety of wheat to be sown with it meant the loss of some points. The presence of just a few "bunty" heads and a little "take-all" further reduced the marks, and half a point was dropped through the presence in the crop of a few heads of barley. The general excellence of the crop appears to be due to good farming practices generally, consisting of thorough cultivation, heavy seeding, and a fairly liberal application of superphosphate.

2. *Mr. H. Goldsworthy—Curramulka (Late Gluyas and Currawa)*.

The crops of Late Gluyas and Currawa submitted by this exhibitor were in really good order and condition, and, as the details of allotted marks show, the main difference between this crop and Mr. S. Greenslade's is in "apparent yield," but the soil is neither so even nor so good as for this latter crop. The presence of quite a lot of barley in the Late Gluyas block and some charlock and an occasional plant of horehound, sand rocket, &c., in both crops accounted for the loss of points for cleanliness.

3. *Mr. A. Greenslade—Maitland (Federation)*.

Although more points were allowed to this crop for "apparent yield" than for No. 2 crop, the unevenness of the crop, the presence of more "rogues," and much more "flag smut" and "red rust" being in evidence brought the total a little lower than for Mr. Goldsworthy's wheat.

4. *Mr. C. F. G. Heinrich—Kilkerran (German Wonder)*.

This was a very nice, even crop, containing only a little charlock and some wild oats.

—5. *Mr. G. L. Greenslade—Maitland (Federation)*.

The presence of some "take-all" and "flag smut" and quite a lot of weeds, such as barley, poppy, drake, charlock, soapwort, wild oats, &c., kept down the total marks for this crop.

—5. *Mr. J. Polkinghorne—Curramulka (Late Gluyas, Federation, and Currawa)*.

Both the Federation and the Currawa blocks were very badly mixed with other wheats (mainly Gluyas), and the presence of much barley in the Late Gluyas and some in the Federation, together with such controllable weeds as drake, Broome grass, charlock, and cockspur,



reduced the value of these crops for competition purposes. As the 100 acres entered had been cropped only four times, the land should have been freer from introduced weeds.

7. *Mr. D. E. Brown—Maitland* (Federation and Belgian Wonder).

The fewness of weeds that can be controlled by cultivation showed that the land on which these crops were growing had been well cultivated during a series of years, this being the sixteenth crop. The only weeds at all in evidence were charlock and soapwort. The presence of some "bunt" and "flag smut" considerably reduced the marks for "freedom from disease," and, naturally, the presence of these diseases reduced the possible yield of the crop.

—8. *Mr. S. K. Coleman—Maitland* (Major and Federation).

The crop of Major, which constituted about four-fifths of the total area submitted, would have made a really good crop but for the presence of much "take-all" and many weeds, but even then it was a slightly better competition crop than the Federation, for although there was less "take-all" in this latter crop, there was more "flag smut" and more weeds. The weeds, which should not have been nearly so prevalent, were wild oats, barley, drake, charlock, melilot, and soapwort.

—8. *Mr. L. E. Hasting—South Kilkerran* (Nugget and Major).

This crop was comparatively clean, containing only little barley, drake, charlock, and cockspur, being sure evidence that the land had been thoroughly cultivated, but the block of Nugget, which formed the bulk of the crop, was very badly affected by "flag smut," and the Major was "tip-blighted."

10. *Messrs. Agnew & Sons—Curramulka* (Late Gluyas and Currawa).

As the marking shows, this was a comparatively clean, light crop, but contained a little barley, sand rocket, poppy, and charlock; both varieties contained a little "bunt" and the Currawa showed a few "take-all" patches.

11. *Mr. J. C. Gersch—Curramulka* (Smutproof).

This was rather an irregular, patchy crop, containing many weeds, the most troublesome of which were barley, charlock, poppy, sand rocket, and soapwort.

12. *Mr. G. L. Tippet—Maitland* (Red Russian and Currawa).

This crop consisted mainly of Red Russian which contained much "bunt," and some barley, charlock, soapwort, and canary grass. The small block of Currawa carried the above weeds, also quite a lot of sand rocket, and was rather badly mixed with other wheats.

13. *Mr. R. Kelly—Maitland* (Nugget).

This crop must have been a very promising one a bit earlier in the season, but "take-all" has played havoc with it, reducing the possible yield, making it very irregular, and allowing various weeds to develop strongly in many places.

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## OBSERVATIONS AND RECOMMENDATIONS.

During the tour of the Maitland to Curramulka district on Yorke Peninsula in connection with these competitions, many extremely good wheat crops were seen, but much improvement could still be made in the wheat crops by more attention to some of the details which are quite necessary if maximum crops are to be aimed at. In some of the crops entered for competition, as well as in many other crops, quite a number of controllable weaknesses were in evidence, all of which do something towards reducing the returns secured from the land, and all of which should be controlled to a greater extent than at present. Amongst the worst of these troubles are:—

1. The presence of bunt or stinking smut.
2. Take-all much in evidence.
3. The prevalence of flag smut.
4. The introduction of bad weeds with the seed, such as barley and drake.
5. Wheats grown which are badly "mixed" with other varieties.
6. The growing of obviously unsuitable varieties.
7. Too little seed used where the weeds are not killed when fallowing.
8. Insufficient fertiliser.

1. BUNT OR STINKING SMUT (*Tilletia tritici*.)

Of the smuts, bunt is by far the worst that South Australian farmers have to contend with. With this fungus the fertile branches are produced in the ear of the wheat plant, and the spores are formed inside the skin which in ordinary circumstances would have enveloped the wheat grain. This collection of spores, covered by a skin as it is, is known as a bunt ball, or smut ball, and consists of a mass of evil-smelling dark-brownish powder, from which fact arises its name, stinking smut. The damage done by the disease is the reduction of yield through the grain being replaced by the spores, and the lessened value of the grain for milling purposes, because the offensive odor and dark color of the spores spoil both the color and odor of the flour made from affected wheat.

## INFECTION OF WHEAT CROPS BY BUNT.

As the collections of spores are contained in the skins of the wheat grains, and these are held by the glumes or chaff of the wheat heads exactly as if they were sound grains, the diseased heads are harvested with the healthy ones and the spores of the bunt are mixed with the good grain at harvest time; any of this grain used for seed is already infected by the disease, and given ordinary seeding conditions the resulting crop will be diseased. This is the main infection for bunt; indeed the infection of the seed is the only one of any account in ordinary practice, and if not brought about through the crop being "bunty" it is often done by using machines already covered with spores, or putting the grain for seed into bags that had previously held "bunty" grain.

## PREVENTIVE TREATMENT FOR BUNT.

The most practical way of preventing this disease is to kill the spores before the grain is sown at seeding time by treating the seed with a substance that will prevent the spores from germinating without injuriously affecting the wheat grains. Of these substances, a solution of copper sulphate or bluestone in water is effective.

## COPPER SULPHATE AS A "PICKLE" TO PREVENT BUNT.

This treatment of seed with a solution of copper sulphate to be effective in the killing of the bunt without injuring the grain rests mainly on the two following points:—(a) The strength of the solution in water, and (b) the thorough wetting of all the grain. (a) The solution should be at least what is known as a 1 per cent. solution, and not more than  $1\frac{1}{2}$  per cent. solution, except in very exceptional cases. These strengths are roughly represented by 1lb. of copper sulphate in 10galls. of water for a 1 per cent. solution, and  $1\frac{1}{2}$ lbs. copper sulphate in 10 galls. of water for a  $1\frac{1}{2}$  per cent. solution; 1 per cent. is strong enough if the seed to be pickled is not very badly infected,  $1\frac{1}{2}$  per cent. makes it a little surer, but is unnecessarily strong in anything but bad cases, and over  $1\frac{1}{2}$  per cent. certainly kills all the bunt, but also reduces the germinating powers of the grain rather considerably. (b) To thoroughly wet the grain with the solution some method must be used that rubs the grains well together; if this is not done air bubbles remain on the surfaces of the grains and many spores of the fungus could nestle under these and never become wet. This can be illustrated by dropping a handful of grain into a bottle containing some solution, when the air bubbles on grains are easily seen, and if the grain be left in the bottle for a week the bubbles will be found to remain intact. That each of these air bubbles might cover a lot of the spores is easily recognised if you remember that the spores are microscopic, and so small that it takes from between 2,000 and 3,000 of them placed alongside one another to extend 1in. The best method of rubbing these grains together so as to break these air bubbles is by using a shovel to turn a heap of loose wheat on a floor after pouring the requisite amount of solution on to the heap; this method will necessitate the use of about  $2\frac{1}{2}$ galls. of solution to a bag of seed, and should be turned over from three to five times. Where no suitable floor is available the next best method of pickling with a copper sulphate solution is to put about 1bush. of seed in a bag, tie loosely, and immerse the bag in the solution for five minutes or so. There are a number of pickling machines on the market, most of which rely largely on the fact that all unbroken bunt-balls and other light material floats on the surface of the liquid and can be skimmed off. This is certainly a great advantage when the seed is dirty and badly "bunted," but it is only one part of the operation, and really not as important as rubbing the grains together to get them thoroughly wet. Seed that has been pickled with a bluestone solution can be left almost indefinitely before sowing, provided that it is thoroughly dried before being rebagged. Indeed the germination of pickled seed that has been allowed to dry and kept for some time is usually greater than if the seed is sown soon after pickling.

## CONTROLLING BUNT BY FORMALIN.

Another liquid used fairly largely in Australia as a preventive to bunt is formalin. This to be effective should be at least a  $\frac{1}{4}$  per cent. solution, i.e., 1lb. of commercial formalin in 40galls. of water. When this substance has been used the grain should be sown when still damp immediately after pickling; if allowed to dry it should not be sown for at least a fortnight, or if it becomes necessary to use the seed before that time is up it should be thoroughly wetted with water. Once grain pickled with formalin has become dry its germinating power gets less for a week, but after that time it gradually improves until one month after treatment. Formalin is a solution of a colorless gas in water, so that it is easily adulterated. In commercial formalin this should be a 40 per cent. solution of formaldehyde gas in water, but some formalin supplied to farmers at Nhill one year on analysis only showed 20 per cent formaldehyde. Formalin is an effective pickle when guaranteed material is used and when ordinary care is taken, but because of its liability to adulteration and the need of immediately sowing the grain, bluestone at the present is the more reliable of the two.

2. TAKE-ALL (*Ophiobolus graminis*).

Besides the presence of "bunt," too much "take-all" was to be seen in many crops in the district, some of them being quite as badly affected as is expected in a number of our newer mallee districts where the disease usually does much damage, whilst a large proportion of the crops showed patches that were affected. When properly understood this disease can be fairly well controlled, and, as the damage done by it is very considerable, every effort should be made to keep it in check.

The disease is a fungus growth living on and so affecting the young wheat plants, and should rather be known as wheat stem killer than take-all, as it mainly affects the bases of the stems of the wheat plant, and when present to any great extent is so severe on the plants that they only grow a few inches high before dying back. In the field it affects patches of the wheat crops, and can be recognised by the affected patches being more or less circular in shape with their centres quite bare, and the plants in the diseased circle gradually improving until the healthy plants on the edge of the ring are reached. The affected plants are usually easily recognised by the fact that the bottom two inches or so of the stems is more or less covered with a brownish powder, or at all events is stained a brownish color. This latter means of recognition is of importance to the farmer, as the affection of the wheat with which this disease in most often confounded is the result of climatic action, and usually spoken of in this State as the "blighting off" of the wheat crop.

It has been the experience of most farmers, especially in low rain-fall areas, that once a field has been affected with take-all, if wheat be grown there as the next crop, even on fallow, it will be affected by the disease, and very possibly have a worse attack than the previous crop. Also that unless something be done to check the disease wheat-growing will have to be given up on that particular land for a time, and some other crop grown

## INFECTION OF WHEAT CROPS BY TAKE-ALL.

As this parasitic fungus lives on the base of the stems and roots of the wheat plant, and as the badly affected plants do not produce heads of grain, the chances are that the grain harvested from affected crops and used for seed the following year is not affected with the spores of the disease. The infection of the crops is most likely brought about in the soil, more particularly from the stems of the plants that are buried when the soil is being ploughed.

## PREVENTIVE TREATMENT FOR TAKE-ALL.

(1) As the straw left after harvesting an affected wheat crop is the most likely means of infection, the first step in the eradication of the disease should be the burning of the stubble. This will actually burn much affected material, and in places at least will kill many spores on the underground stems and roots by the heat generated.

(2) As the fungus has been found on many of the plants that are usually found growing on our wheat lands, properly working the fallows, and keeping them free from all weeds will tend to reduce the disease.

(3) One crop that will grow more or less well wherever wheat can be grown well—the oat crop—is but seldom, and then never badly, affected by this disease. This being so, when wheat crops are affected, the disease can be checked on that land by the growing of oats instead of wheat for a few seasons, especially if this done on well-worked fallow land. The oats not being readily attacked by the fungus tend to starve it out of the land.

(4) Until the fungus causing the trouble was isolated a few years ago, it was usual, in this State at any rate, to consider the disease as being a mechanical one. It is not long ago that a common saying amongst farmers was, "Late fallow brings take-all," and also, "Ploughing in a lot of straw or rubbish brings take-all." These two things—late fallow and ploughing in much straw—certainly appear to encourage the disease, so much so that I personally believe that the holding of the disease in check depends more on the mechanical condition of the soil than on anything.

The reason that late fallow and ploughing in much straw encourages the take-all disease appears to rest on the fact that in most seasons they do not tend toward soil conditions ideally favorable to the growth of wheat, particularly when the wheat is in its earlier stages, when the disease is most active. From studying the disease for some years now I am convinced of the fact that even in soil more or less badly infected with this disease, if the wheat crop gets a really good start and continues in good healthy growth there will be hardly any evidence of the trouble. This healthy growth depends very largely on the soil being in a state of good mechanical condition, and late fallow and much dry organic matter in the soil, as a rule by no means give mechanical condition good enough to promote this growth. In its simplest form the ideal seed bed for wheat consists of soil that has been ploughed up and

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then so worked that only the immediate surface 2in. or so is loose, and the soil immediately under it firmly compacted together. It is in a seed bed such as this that wheat will give its best yields, other things being equal, and I feel quite convinced that if seed beds like that described were always attained we would hardly know what take-all is. In the ordinary operations of bare fallowing, obtaining this seed bed is one of our main objects, even if it is done in most cases unconsciously; and if the land is ploughed early, the rains that fall compact the under surface by running the particles together, and we cultivate the surface of the land to keep it free from strong crusts and from weeds. These operations get us somewhere near the ideal seed bed. But in the case of late fallow the ploughing is usually done after the heavy rains of the year are finished, and so not enough rains fall throughout the time between ploughing and seeding to compact the under surface soil. This leaves the soil, as it also does when a large bulk of organic matter is ploughed in, with more or less large spaces in the under layers, which, when the roots of the wheat plants reach them, naturally give a check to the growth of the plants; and, unfortunately, to make it worse, this check to the plants comes just at the time when the fungus is most active and when the wheat plants are weakest. In all land that is cleared, i.e., free from stumps, the producing of good mechanical condition of the soil or an ideal seed bed for wheat can be brought about by the use of land rollers. As this disease spreads the use of rollers is becoming more necessary, and instead of depending so much on the rains that fall after the seed is in the soil to compact it together, as is the common practice at present, rolling the land will become just as important and necessary an operation as is harrowing. In practically all seasons a heavy rolling of the land is advantageous, but it is an essential operation when rains sufficiently heavy to compact the soil have not fallen on the fallowed land.

### 3. FLAG SMUT (*Urocystis tritici*.)

A very considerable amount of this disease was noticeable throughout the district, and one crop inspected was so badly infected that at least 5 per cent. of the plants would not produce grain.

This is often incorrectly known as black rust, but is essentially a smut and not a rust. Here the fertile branches are produced in the leaves and sheath of the wheat plant, and the disease is characterised by the appearance on the leaves of long, bluish-black lines, more or less parallel to one another, and the leaves become very much twisted and curled. These lines contain a black powder, which, to the naked eye, is very similar to the other smuts. The disease usually appears when the plants are young, and generally keeps them so weak that they are unable to produce heads. The damage done is often fairly great in this State, but the cause of the reduced yield is not always recognised until pointed out, as the diseased plants have broken down by harvest time, and are not readily seen unless particularly looked for. This damage is solely reduced yield through the disease preventing the plants from producing grain.



## INFECTION OF WHEAT CROPS BY FLAG SMUT.

As this fungus disease affects the leaves of the young wheat plant and rarely allows it to come into ear, the chances are that infection comes in every case through the medium of the soil by spores dropping into the earth and by the affected stalks and leaves being ploughed in at fallowing time. And as these spores will pass through animals and remain alive, infection will come from the manure of animals eating affected straw or chaff.

## PREVENTIVE TREATMENT FOR FLAG SMUT.

Where this disease is found to be present to any great extent the first operation of a preventive nature should be the burning of the stubble. This will directly destroy a very large number of the spores, and will leave the land so free from rubbish that good, close fallow should result. Fields affected should be fallowed as early as possible, which will possibly lead to the germination of the fungus spores, and they will die for the want of a host plant.

Fields affected should not be sown early, indeed they should not be sown until some time after the first autumn rains, for it has been found that wheat sown early is always affected to a greater extent than that sown late in the same field. Change of crop must be practised in places where the disease has appeared, as the growing of wheat after wheat encourages the trouble.

Some varieties are more liable to attacks than others, so resistant ones should always be chosen when once this fungus has been noticed.

## 4. THE INTRODUCTION OF BAD WEEDS WITH THE SEED.

Quite a large proportion of the wheat crops seen contained barley, and many also had a fair sprinkling of drake. These are two very bad weeds for not only do they grow as strongly as do the wheat plants and so replace some of the crop, but at the same time the presence of barley grain and drake seed in the wheat to be marketed reduces the price that can be obtained. Where land is bare fallowed it is quite a rare occurrence for either barley or drake seed to remain in the soil for 12 months without germinating, and so their presence in a crop is usually accounted for by the fact that the seeds were sown with the wheat. This trouble can be overcome by only using seed taken from "clean" crops, and, failing this source, grading the seed will remove all drake and considerably reduce the amount of barley. Grading not only reduces the proportion of weed seeds, but it is found to increase the yields of crops very considerably and is quite a business proposition, costing somewhere about 9d. per bushel to grade (including the difference in price received for wheat that is removed) and can be depended upon to increase the returns by 2bush. to 3bush. per acre on the average.

## 5. THE GROWING OF BADLY "MIXED" WHEATS.

For seed purposes it is, of course, quite essential that each variety of wheat grown be true to type and, although this does not apply with the same force for ordinary "market" wheat, particularly if

the admixture consists of varieties with the same maturing period as the main crop, it is really bad practice to have mixtures of different classes of wheats. It was by no means an uncommon sight to see such "mixed" crops, and quite away from the possibilities of increased money returns from selling the crops as seed, an improvement in yields would follow the taking of more care with the seed to be sown.

#### 6. UNSUITABLE VARIETIES.

It is generally recognised now-a-days that certain types of wheat prefer and give bigger returns in special classes of soil, and where the soil conditions vary as they do in this particular district more notice should be taken of this fact. In this connection it is known that in typical South Australian calcareous conditions, *i.e.*, limestone soils with comparatively low average annual rainfall (14in. to 18in.) the type of wheat giving best average returns consists of those varieties with tough, more or less willowy straws, and tough, shiny chaff, and where these conditions obtain the following varieties should improve the yields:—

Caliph.	Late Gluyas
Currawa.	Leak's Rustproof.
Sultan.	Walker's Wonder
Felix.	King's Red or King's White.

In heavier textured soils not supplied with an excess of lime, and having an average annual rainfall of 16in. to 20in. or more, the stiffer strawed, more flaggy wheats with softer chaff give better grain yields without the same tendency to lodge as happens with some of the above-mentioned varieties, and for these conditions the following varieties are recommended:—

Federation.	Currawa.
Onas.	Yandilla King.
Minister.	Caliph.
Major.	

#### 7. INCREASING THE AMOUNT OF SEED.

In South Australia it is found that when soils are first brought into cultivation they are comparatively free from weeds, and whilst this is so, 30lbs. to 50lbs. of seed wheat per acre is ample to give maximum grain yields, but as the cropping is continued the land quickly becomes weedy, and to keep these in check it soon becomes necessary to increase the seed used. This providing of plenty of plants of the crop you wish to grow is often lost sight of as the best means of controlling the weeds by smothering them, and, in those seasons where weeds cannot be properly killed on the fallows, the addition of 10lbs. to 20lbs. of seed to the ordinary amount used per acre generally gives markedly increased yields.

#### 8. INCREASING THE AMOUNT OF FERTILISER.

In the great bulk of South Australia, including this particular district, the minimum application of 36 per cent. superphosphate should be 1cwt. per acre, and the chances are that in these soils it would still be a business undertaking to increase this dressing to 1½cwt. per acre.

## FORAGE POISONING.

[By LIONEL B. BULL, D.V.Sc., S.A. Government Laboratory of Bacteriology and Pathology, Adelaide Hospital.]

Horse owners in South Australia have suffered losses of stock for many years from a disease which has been variously called "cerebrospinal meningitis," "toxaemic paralysis," "horse paralysis," &c. Cattle owners have also suffered losses of their animals from a somewhat similar disease, which has usually been called "Dry Bible." There is good evidence to suggest that the disease in horses and that in cows may have a common cause, as was pointed out by Gilruth (1913). At present, however, our main concern is with the disease in horses, as it has been observed in this State. A similar, if not the same, disease has been observed in other States of the Commonwealth, but it is probably more common in South Australia. In collaboration with the veterinary officers of the Stock Department, the present writer has carried out an investigation into the nature and cause of the disease since the latter part of 1912. The investigation has been somewhat spasmodic, owing to various causes, and was seriously interfered with during the years of the Great War. However, as opportunity offered, observations and experiments have been made, and useful information has been collected. One of the greatest difficulties one has to contend with is due to the tardiness of stockowners in informing the Stock Department of outbreaks of disease. It is not until many animals have been lost, and the outbreak has practically exhausted itself, that the stockowner asks for the advice and assistance of the officers of the Stock Department. At this late hour it is impossible to collect all the evidence and information that are essential to such an investigation. Stockowners are often impatient, and want results immediately, and unless the veterinary officer can give them something in a bottle that will drive away their troubles, they are dissatisfied, and disinclined to seek advice or help in investigation. In spite of the difficulties under which we have labored, certain progress has been made.

There are few records of the occurrence of the disease in South Australia. McEachran (1912), in the form of a progress report to the Minister of Agriculture, recorded certain observations and the result of a feeding experiment, which was rather indefinite. He mentioned that the disease had caused considerable mortality among horses in various parts of the State, but chiefly north of Adelaide, and that the majority of outbreaks had been in the summer. He was satisfied that the evidence he had collected definitely pointed to the fodder as being responsible for the disease. Place (1918) claimed to have discovered the true nature of the disease, and said that it was none other than equine infectious anaemia, a disease well known in other parts of the world, that had remained unrecognised. We have, at present, no evidence to support his view.

The most valuable contribution to the study of the disease in Australia was made by Gilruth (1913), and although his work was conducted on an outbreak of the disease in Victoria, there is no doubt that the particular outbreak that he records was an occurrence of the same disease as we find in South Australia. This is the opinion of Mr. W. R. B. Wakeham, M.R.C.V.S., Mr. F. Murray Jones, M.R.C.V.S., and the present writer, who had an opportunity of witnessing the outbreak in Melbourne, and of comparing it with similar outbreaks in South Australia. The following is a brief account of the disease as it has been observed in South Australia.

*Season of Appearance.*—Although it would appear that the disease is more commonly found in the warmer months, there seems to be no doubt that it may occur at any time of the year.

*Animals Susceptible.*—For the most part the disease occurs in stable-fed animals. Animals receiving hand feeding are more likely to contract the disease than those running on natural pasture. The disease is rare in animals receiving no hand feeding, and only two outbreaks have been observed in recent years under such circumstances, and in each outbreak the animals were grazing on stubble land. It is rare to find the disease in any but well-conditioned animals. Some animals would appear to be resistant.

*Occurrence.*—The disease is more common in the country than in the metropolitan area. Usually more than one animal is attacked in a stable, but rarely 100 per cent. The cases occur over a short period, usually one to two weeks. At present there is no definite evidence that seasonal variation plays any part in the occurrence of the disease.

*Symptoms.*—These are known to vary considerably in various outbreaks and to some extent in different animals affected in the same outbreak. Usually, the first symptom to be observed is an inco-ordination of movement of the limbs, a somewhat sluggish, unsteady gait. This increases in intensity more or less rapidly, and is accompanied by an increasing weakness and loss of power. The animal will lie down and rise with difficulty, or not at all. As the disease progresses the animal will be totally unable to rise, and although consciousness is retained, there is complete lack of interest in surroundings. The limbs are moved in a paddling fashion, and there may be sweating. The animal makes no attempt to rise, and the paddling movement of the limbs becomes less frequent. There is usually response to external stimuli, such as a pin prick, and there may be an exaggerated corneal reflex. The animal passes into a comatose condition, with no response to external stimuli except corneal. The temperature is normal or subnormal, and the pulse weak, but not usually increased. with no response to external stimuli except corneal. The temperature is normal or subnormal, and the pulse weak, but not usually increased. Death usually occurs in from 24 to 48 hours after the animal goes "down." In other cases the first symptom may be a difficulty in swallowing. This may progress slowly, the animal refusing food and drinking with difficulty. A certain percentage of animals may recover, the symptoms sometimes rapidly disappearing. These recoveries are more likely to occur in the latter part of an outbreak.

The majority will, however, develop symptoms as outlined above. At times slightly colicky pains may be observed. In one outbreak, at least, violent trembling was a marked feature. Although difficulty in swallowing (pharyngeal paralysis) is not always present, it is a most characteristic symptom. The most marked feature of the disease is the general and progressive weakness. Sometimes death may occur suddenly, but more usually the animal slowly becomes powerless and passes into a semi-conscious and then an unconscious state. Usually outbreaks are characterised by a certain chain of symptoms. In some outbreaks pharyngeal paralysis will be a well marked symptom, while in other outbreaks it will not become manifest at all, but some other symptom, as inco-ordination of movement, may be shown by all the animals affected.

*Course.*—In some cases death may result in 12 hours from the manifestation of the first symptoms, usually in from 48 to 72 hours, although sometimes the animal may be ill for a week before the more serious symptoms develop, to be followed by death in from 12 to 24 hours. The more protracted cases usually occur in the latter part of an outbreak.

*Mortality.*—This varies with the outbreak, but for the most part is high. Probably death results in from 20 to 90 or even 100 per cent. of animals showing symptoms.

*Post-mortem Appearances.*—There would appear to be no characteristic changes to be found in the various organs after death. The tissues of the central nervous system appear to be those most affected, but the changes produced are more or less of a microscopic character. One may see congestion of the vessels and minute hemorrhages, but apart from these, there are no changes easily detected by the naked eye. There seems to be a distinct tendency to small hemorrhages, and these may be found in almost any tissue, and constantly in the endocardium. The changes produced in the various organs depend to a great extent upon the length of the illness; that is, they are for the most part secondary in nature, and are not characteristic of this disease alone (pathognomonic). There is usually some congestion of the mucous membrane of the stomach, but the small intestine rarely shows any change. Commonly, some inflammatory change occurs in the large bowel, where there may be hemorrhagic areas, and sometimes a mucoid colitis. Microscopic examination of the various tissues reveals nothing of great significance, but the changes produced in the brain and spinal cord are of interest and importance. Congestion of the blood vessels, small hemorrhages, usually perivascular, and some perivascular oedema are to be seen in the meninges. The same changes in and around the vessels are to be seen in the brain substance itself and in the cord. In one case examined some years ago very distinct (*macroscopic*) hemorrhages were found in the medulla, in the floor of the fourth ventricle. The nerve cells usually show distinct changes, shrinkage, loss of nuclear staining, vacuolation, and invasion by round cells.

*Cause (Etiology).*—We cannot claim to have definitely established the cause of the disease at present. We believe that the disease is produced by some poison or toxin that is taken in with the food. We

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do not believe that any poisonous plant is in any way associated with the occurrence of the disease. It is not an easy matter to prove definitely that the food is responsible for the trouble. It is only by taking some of the suspected fodder and producing the disease in an experimental animal that we can definitely prove that whatever produces the disease is certainly associated with the food. This was successfully accomplished by Gilruth, in Melbourne; but we have not been so successful. Before making a more definite statement as to the cause of the disease, it may be helpful to mention as briefly as possible some of the experiments we have made.

*Experiments.*—The experiments conducted have been made mainly with the object of determining—(1) if the disease can be conveyed from an affected to a healthy animal; (2) if the food will produce the disease in an experimental animal kept under close observation; (3) if some toxin or bacteria can be isolated from the food which will produce similar symptoms to those seen in affected animals; and (4) if bacteria can be isolated from the animal, grown under artificial conditions and used to produce the disease.

(1) As there has been little to suggest that the disease is of an infectious nature, not much time has been spent in attempting to convey it from one animal to another. Cerebro-spinal fluid has been collected from a diseased animal and inoculated intraveneously into a rabbit without producing any result. Blood serum has been collected from a diseased animal and inoculated into a horse without producing any departure from the normal. The most important experiment done under this head, was an inoculation of an emulsion of portion of the brain and cord of a diseased animal, collected in the field by the Government Veterinary Surgeon (Mr. C. A. Loxton, B.V.Sc.), beneath the coverings of the brain (subdural) of a healthy animal. The portions of brain and cord were collected and placed in diluted glycerine (33 per cent.) in order to prevent decomposition. About 10 days later, these were finely ground up and a small quantity (1 c.c.) of the resulting emulsion was inoculated beneath the dural membrane of a healthy horse. After recovering from the anaesthetic the animal showed no departure from the normal. Although these experiments are few in number, they may be held to support the view that the disease is not of an infectious nature.

(2) At least three attempts have been made to produce the disease with food that has apparently been responsible for producing it on the farm or in the stable. In one experiment as much as 1 ton of chaff was fed to two horses. One of these animals died 14 weeks after the commencement of the experiment, but we do not believe that the suspected fodder was responsible. This ton of chaff was obtained from a farm on which there had been a serious outbreak of the disease, the owner losing most of his horses. The chaff appeared to be definitely incriminated, but we were not able to produce the disease with it. The experiment was rendered almost valueless by the fact that we did not receive the chaff until a month or so after the outbreak, and we believe that after this length of time it had lost its harm-producing properties. In none of the experiments have we been successful in reproducing the disease. There are great difficulties in the way. We

do not know how long after eating the harmful food the animal develops symptoms. It is difficult, therefore, to determine the lot actually responsible, for in the country the farmer often changes from one lot to another, and in the town the stable manager often only buys in small quantities. There is some evidence to suggest that, as a stack of hay is being cut, trouble may occur when the centre is being reached. It is possible that only a small part of the stack contains hay that will prove harmful. It is probable, therefore, that in many cases the harmful food has all been consumed before the disease becomes manifest, and the possibility of obtaining some of it for experimental purposes is remote. Again, the effect of the oxygen of the air, sunshine, &c., probably is to render harmful food quite harmless. The delay involved in collecting the material and arranging the experiment, therefore, acts to produce a negative result. In the majority of cases the hay or chaff is in perfect condition and there is nothing to suggest that it might be dangerous to use. Likewise, there is usually nothing to help the investigator in selecting the harmful material.

(3) Several attempts have been made to isolate from suspected forage bacteria which might produce a poison, which, when taken by the mouth, would set up a condition similar to that found in affected animals under natural conditions. Only one of these experiments has given an encouraging result. In this case the material was collected by the direction of Mr. Murray Jones, who was investigating the outbreak (February, 1921), from an area in a stubble paddock that had been used for winnowing. The horses had been grazing in the paddock and had received no hand feeding. This is one of only two outbreaks that have come under our notice where hand feeding can be definitely excluded. The winnowing floor was noticed by Mr. Jones to have much damaged grain and other vegetable material thickly spread over it. Some of the grain had sprouted and there was evidence pointing to the fact that the animals had been foraging over this area. Some of this material was scraped up and forwarded to the laboratory. Tubes of culture media were inoculated and it was found that after one week's incubation at 25°C., under anaerobic conditions, a poison or toxin was produced in the tubes, which, when fed to guinea pigs, would kill them in a characteristic way. In the first experiment, a few drops of the culture were placed on some crushed wheat and given to a guinea pig to eat. The animal refused to touch the food (the culture had a strong putrefactive odor), for about 36 hours, but later ate it and died in about four days after the commencement of the experiment. After the tubes had been incubated for 24 days, six guinea pigs were given a few drops (0.5 to 1 c.c.), by the mouth of culture from various tubes. The animals died in from 60 hours to four days. The cultures, of course, contained many varieties of bacteria as the material contained dung and much other matter heavily contaminated by bacteria. An attempt was made to isolate in pure culture the bacterium which produced the poison which was absorbed through the mucous membrane of the digestive canal. The attempt was unsuccessful, owing to the technical difficulties involved. Through the pressure of other work



one was forced to leave it for the time. It is only now that the work is being taken up again with the hope of successfully isolating the bacterium. The results of these experiments strongly suggest that *Bacillus botulinus* was present in the material examined. This bacillus is characterised by forming a powerful toxin during its growth that is capable of passing through the mucous membrane of the digestive canal and affecting the central nervous system. We know of no other toxin with the same properties, and the result of the test offers strong presumptive evidence that this bacillus was present in the material collected from the winning floor. This organism, although classed as a strict anaerobe, is nevertheless capable of growing in the presence of atmospheric oxygen when it grows in symbiotic relationship with moulds and other bacteria. The bacillus apparently found the mass of damaged (mouldy) and sprouting grain which formed a thick mat over the area mentioned, a suitable material in which to grow. The animals, picking at the grain and the other more or less attractive vegetable matter present, would be liable to take sufficient toxin to produce fatal results. A small bag full of this material was mixed with chaff and fed to an experimental animal without producing any symptoms. The toxin presumably had, in the meanwhile, been destroyed by contact with the atmospheric oxygen. In 1917 several severe outbreaks occurred. The chaff apparently responsible was examined and found to be heavily infected by a parasitic fungus (*Septoria*). Extensive experiments were made with extracts of this fungus, but one failed to demonstrate that it was in the least toxic for experimental animals.

(4) As it is likely that the micro-organism, which grows in the fodder and produces its toxin there, is taken into the digestive canal along with the food, search has been made in the contents of the intestine for such a bacterium without success.

*Summary.*—Experimental work has given very little positive evidence. In so far as it has gone it has confirmed our belief, based upon a general study of the disease, that it is not an infection with which we have to deal. The disease appears to be entirely a poisoning due to the eating of fodder that contains a toxin (poison) produced by the growth of a micro-organism, not an infective process due to the growth of a micro-organism in the animal body. The demonstration of the presence of a toxin-producing micro-organism associated with certain spoiled forage strongly supports this view. The failure to produce the disease in experimental animals by feeding with the suspected fodder is due, we believe, first to the difficulty of obtaining a sample of the food which has actually produced the disease. This difficulty is due to the lapse of time which must occur between the consumption of the food by the animal and the development of symptoms (five to 20 days, as observed by Gilruth), and the probability that, in most cases, only a relatively small quantity of the food is actually toxin-laden, which make it, for the most part, impossible to determine the sample which is toxin-laden if it has not all been consumed. In the second place, the toxin is more or less slowly destroyed by oxygen and sunlight, so that any delay occasioned in arranging the experiment acts in the direction of producing a negative result.

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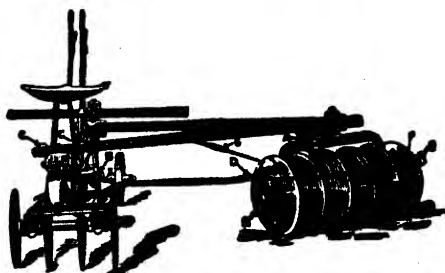
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*Discussion.*—Mention has been made of the *Bacillus botulinus*. This bacillus produces a toxin which has been shown to produce symptoms in horses corresponding to those seen in the disease under discussion. It was first isolated from a sausage responsible for the production of fatal poisoning in the human subject. Of recent years, however, it has been found to be more commonly associated with vegetable than animal foods. The most important contributions to the study of forage poisoning in horses have been made in the United States of America. Buckley and Shippen (1917) made a preliminary report on the relation of anaerobic organisms to forage poisoning. They state that Shippen suggested, about 1915, that the disease bore a close resemblance to botulism in man. He obtained a culture of *Bacillus botulinus*, which had been isolated from cheese, and demonstrated that it was capable of forming a powerful toxin which would produce, in experimental horses and donkeys, a fatal condition indistinguishable from forage poisoning. The conclusion arrived at was that the disease may be caused by a toxin similar to that produced by *Bacillus botulinus*, or that some cases of forage poisoning may actually be done to certain strains of the *Bacillus botulinus*. Following on the suggestive work of Buckley and Shippen, Graham, Brueckner, and Pontius (1917) isolated *Bacillus botulinus* from forages associated with these separate outbreaks. The bacillus was also isolated from the caecal contents of horses dead of the disease. They say that the experimental data on hand quite strongly incriminated the organism with its toxic growth-products as a probable factor in general outbreaks of the disease. The same difficulties that we have experienced in producing symptoms in experimental animals by feeding them on suspected fodder and in obtaining cultures of a toxin-producing bacillus from the suspected fodder have been experienced in America. Nevertheless, evidence is gradually being accumulated which strengthens the previous evidence incriminating the *Bacillus botulinus* in outbreaks of forage poisoning in horses and cattle (Graham and Schwarze, 1921).

It has been shown (Burke, 1919) that there are two types of *Bacillus botulinus*, each forming a toxin which has the same fatal effect on animals. An antitoxin can be prepared against each toxin, but the antitoxin prepared against the one has no neutralising effect against the other. These antitoxins may be used to treat affected animals, but, up to the present, their use has not given encouraging results. It is possible that they may be of value if used when symptoms first develop, but more particularly as a preventative when used early in an outbreak. It seems probable that, when symptoms have once developed, it is impossible to rectify the damage already done, but that more profitable results may be obtained if efforts are made to prevent the development of symptoms in other animals that have partaken of the same food.

*General Summary.*—A disease of horses, most commonly known as Toxaemic Paralysis in this State, has been under investigation for some time. All the evidence so far collected points to the forage as being responsible for the production of the disease. The food apparently contains a preformed toxin which is capable of absorption through

the mucous membrane of the digestive canal and of producing fatal results by its action on the central nervous system. In some cases, only a small quantity of food appears to be harmful, and this may have all been consumed before symptoms become manifest in the animals. There are numerous difficulties in the way of demonstrating under experimental conditions the fact that the fodder contains the poison. In one outbreak, however, a toxin-producing micro-organism has been demonstrated as being present in the forage. There is strong presumptive evidence in support of the belief that this micro-organism is the *Bacillus botulinus*. Investigations in the United States of America have demonstrated the association of *Bacillus botulinus* with outbreaks of a disease in horses and donkeys, which is characterised by the same history and symptoms as the disease met with in South Australia and in other States of the Commonwealth. There is strong evidence to suggest that the disease in cattle, commonly known as Dry Bible, is due to the consumption of material containing a toxin such as that produced by the *Bacillus botulinus*. Although specific sera can be produced against the toxins of the two types of *Bacillus botulinus*, it has not yet been demonstrated that they are of value in the treatment of the disease. At present the only useful procedure to be adopted by the stockowner is to stop feeding the fodder which is suspected of producing the symptoms.

#### ADDENDUM.

Since the foregoing note was submitted a further opportunity has occurred of investigating an outbreak of forage poisoning among horses which had been depastured on a stubble paddock. Material, mostly damaged grain, was collected from an area on which winnowing operations had been conducted. The material was forwarded on November 5th, and culture media inoculated. These cultures have now been shown to contain toxic products from the growth of some micro-organism. Guinea pigs drenched with a small quantity of the culture have died in from 27 to 36 hours, with symptoms resembling those found in poisoning with the toxin of *Bacillus botulinus*.

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## POULTRY BUILDINGS.

### BREEDING YARD AND HOUSE-CONTINUOUS SYSTEM.

#### SPECIFICATION OF MATERIALS AND ERECTION.

[By D. F. LAURIE (Government Poultry Expert).]

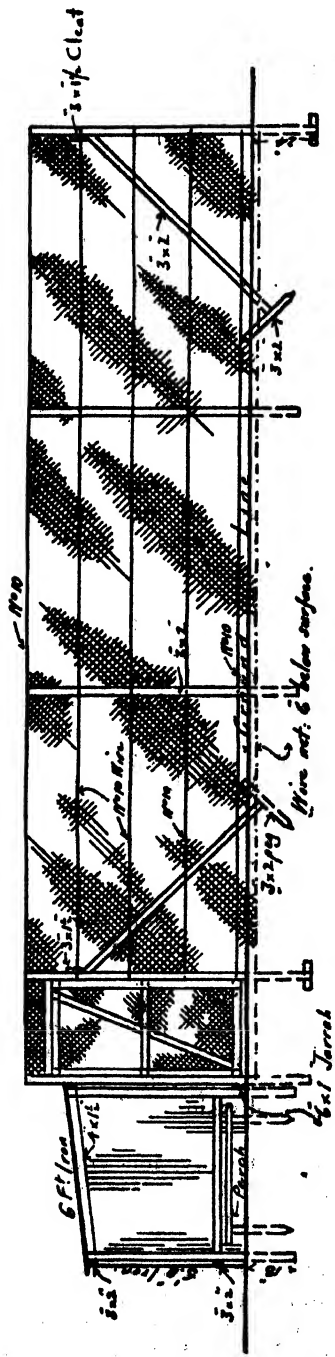
*Materials.*—Galvanized corrugated iron sheathing is to be recommended for general use. It fulfils all requirements, and, unlike most other material, it has good second-hand value. Permanent plants may be erected with concrete, brick, masonry, or sandbrick walling and galvanized iron roofing. The various patent roofing materials cannot be depended upon, even when backed with boarding, which is an expensive matter. Even then the method of construction affords harbor for vermin. The posts, struts, &c., and all material partly under ground should be of red gum or jarrah to avoid attacks from white ants and dry rot. Rails and gates may be of oregon or stringybark. All houses should be floored with brick on sand, or with concrete. Cement concrete is the most satisfactory, although good floors can be made of lime concrete brushed with neat cement before finishing. Three inches is thick enough for such small floors.

*Erection.*—The plan is of a standard breeding house and run. The dimensions are ample to accommodate a breeding pen of the usual size. No advantage is gained by building them any larger. The run is ample. It is better to have small runs and keep them in good condition. Larger runs entail more work and consequently are often in an unsatisfactory condition. When several similar pens are required, they should be erected as follows:—

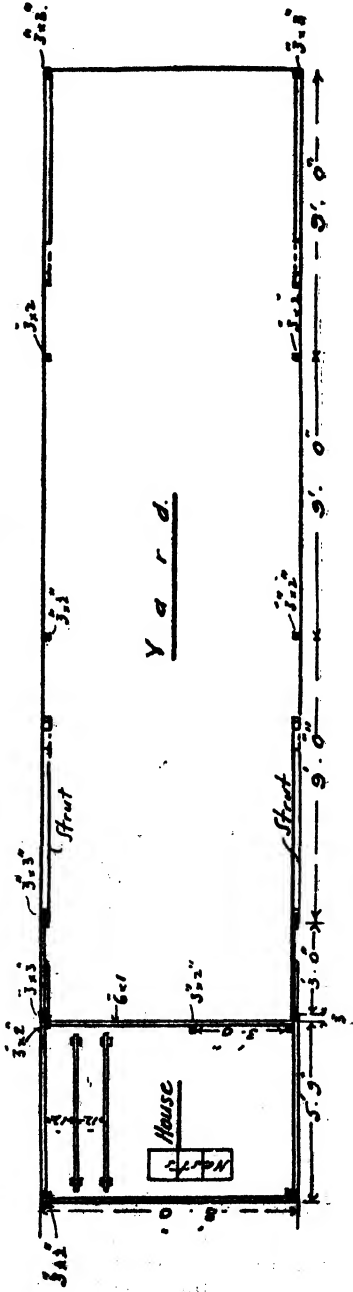
Take out the required number of post holes, 8ft. centres apart, for the back row and erect the posts; ram well and see that they are in perfect alignment. Then erect the posts for the front row, also 8ft. centres, and then erect the door post of each house. Along the front of the houses and at ground level, securely spike to the posts a jarrah board 6in. by 1in. This retains all straw and other scratching materials used on the floor of the house. Then the top and bottom back rails, also the top front rail, all of 3in. by 2in. oregon, are firmly nailed to the posts. The end and division rails, top and bottom, are now nailed to posts.

The back iron can now be fixed and then the division and fronts; finally, the roofing iron is placed in position. Particular care must be taken that the iron is closely fitted at all corners, and that a lap of at least one and half corrugations is allowed, so that not even the slightest draught is possible. This is most important.

*Ventilation.*—In the back wall of the house and opposite the door, frame and fit a sliding ventilator with a clear opening of about 18in. by 9in. or 10in. This will be found useful on hot days.

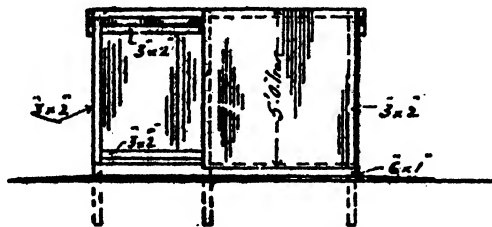


Section thro' Breeding Pen & Elevation of Yard Fencing



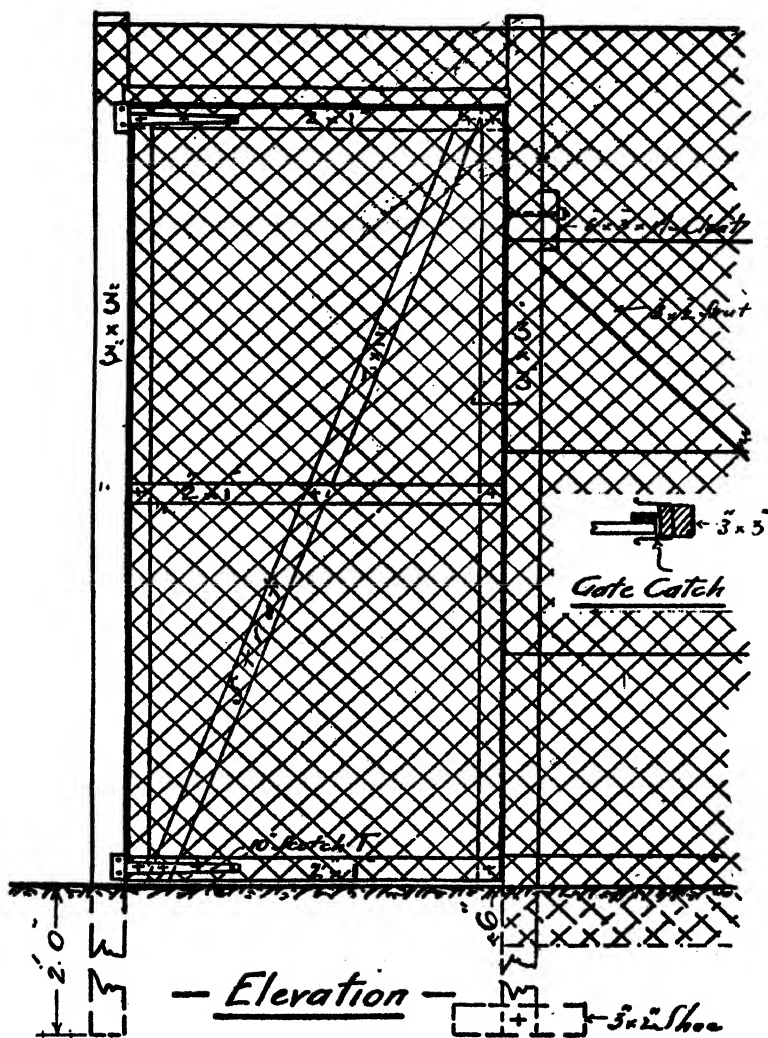
*Perches.*—These may be fixed as shown, or may be framed or suspended. In any case they should be easy to dismantle so that they may easily be freed from vermin, which will congregate in the joints. The perches should be 3in. by 1in., corners rounded and used on the flat, not on edge. One foot above ground level is high enough.

*Door and Gate.*—The gate is shown in detail. It serves as a door to the house when required, and when open completes the run as shown on plan. The gates are made of planed oregon, 2in. by 1in., and are fastened with 2½in. by ½in. carriage bolts. The hinges are screwed to the gate posts, but are bolted to the gate. The screw holes on hinges must be enlarged to take ½in. bolt. The gate catch is made of No. 6 or No. 8 galvanized fencing wire bent as shown. A hole is bored through the gate posts; the wire passed through and then bent at right angles as shown. The ends should be turned in a circle with pliers—this avoids torn clothes.



Front Elevation of Breeding House.

*Wire Netting* of 2in. mesh is generally used. If, however, these yards are to be occasionally used for rearing chickens, the lower portion, say, 24in., may be of 1in. or 1½in. mesh. In erecting the netting—the posts are 7ft. out of the ground—it will be necessary to use two sizes of netting, viz., one piece of 24in. by 1in., 1½in., or 2in., and the top piece of 60in. by 2in., fastened together by binding wire or by Bennett's clips. A trench from post to post and 6in. deep is made, and the bottom selvage of the netting is placed therein, and then nailed to the posts at level of bottom of trench. This prevents the birds from scratching their way out under the netting as generally happens when not erected in this manner. In most localities a windbreak 24in. high and generally of galvanized iron or jarrah boards is erected all round the yards. In such cases the material is buried 4in. to 6in. in the soil and the wire netting starts from the top of this screen. Breeding yards must have the division fences so made that the wind screens will prevent the male birds from fighting. A similar screen must be added to the lower part of the gate in the division fence.





**Nests.**—These may be on the floor of the house. For Leghorns and breeds of similar size, kerosine tins answer well. For heavy breeds, a row of concrete nests may be made on the floor or a half circle of galvanized iron may be used. Use clean sand in nests instead of straw.

In wet localities, or on heavy wet soils, it is a good plan to provide a window 24in. by 12in. or 18in. in the front of the house and close the birds in for the winter and early spring. By so doing you will obtain more eggs and the fertility will be satisfactory. The door will require a bag or hessian curtain for use in wet weather. This will keep the rain from drifting in and wetting the house. When the front is thus closed the ventilator in the back wall will come into use. Unless this curtain is in use the back ventilator should be closed during wet weather.

Grade the runs with a fall away from the house; avoid holes and depressions. Floor the house with an inch or so of sand and provide some straw. The yards should be supplied with straw except in winter when the birds are close housed. When this is done, the yards should be lightly forked over, levelled, and sown with rape, mustard, etc. This will sweeten the soil and provide green food, which will be about finished by end of August when the birds may be allowed access to the yards or runs.

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January and July, 1921.

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## INSTRUCTOR FOR MALLEE LANDS IN THE HUNDREDS OF PEEBINGA AND KINGSFORD.

The hundreds of Peebinga and Kingsford are situated at the eastern end of the Peebinga railway line. This line has achieved evil notoriety because of its unprofitableness, and in consequence settlers have been compelled to rest satisfied with one train a fortnight. In 1919-20 the combined areas of the holdings in both hundreds was represented by about 150,000 acres. Peebinga had 1,583 acres under crop, whilst Kingsford had nothing. In the same season, over 3,000 acres of new land had been cleared in the two hundreds. Agricultural returns from Peebinga were represented by 2,100bush. of wheat, representing 1.52bush. per acre; 25bush. of barley, representing 3.12bush. per acre; 566bush. of oats, representing 6.74bush. per acre; 8 tons of hay, representing 2.32cwt. per acre; 770lbs. of butter; and 200lbs. of bacon.

In view of these generally low returns, the Instructor of Mallee Lands (Mr. C. P. Hodge) was asked to visit individual farms before harvest, and report on their general prospects. This has been done, and it is pleasing to note that results are on the whole fairly promising in the present season.

Mr. Hodge reports that there are now 14 settlers in the hundreds of Peebinga and Kingsford. Of these he inspected eight farms in Peebinga and three in Kingsford. He reports much of the settled country to be a good type of mallee land, supplied with artesian bores yielding water of very good quality. He believes that in the present season the two hundreds will average 10bush. of wheat, whilst he saw several crops which promise a return of 15bush. to 20bush. In view of the alleged prevalence of "take-all" in other mallee districts, Mr. Hodge was asked to keep a look out for it wherever he went. It is therefore satisfactory to note that he reports having seen no evidence of it in these two hundreds, and only insignificant traces of "smut" and "red rust."

The following is a summary of the information collected by Mr. Hodge for these two hundreds:—

Holdings inspected . . . . .	11
	Acres.
Total area of inspected holdings . . . . .	24,082
Arable area of inspected holdings . . . . .	17,544
Cleared area of inspected holdings . . . . .	5,700
Area under crop (1921-22) . . . . .	3,970
New land under crop (1921-22) . . . . .	1,424

*(Crops (1921-22)).*

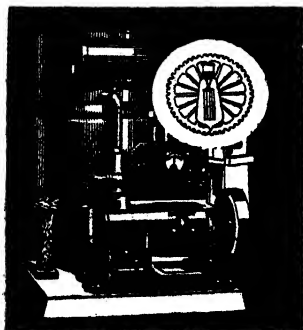
Wheat—	Acres.
On new land . . . . .	1,402
On stubble land . . . . .	2,059
On fallow land . . . . .	54
<b>Total . . . . .</b>	<b>3,515</b>
<b>Oats—</b>	
On new land . . . . .	22
On stubble land . . . . .	337
<b>Total . . . . .</b>	<b>359</b>
Other crops . . . . .	55

*Varieties of Wheat Grown.*

	Acres.
1. Marshall's No. 3 . . . . .	831
2. Early Gluyas . . . . .	482
3. Early Baart . . . . .	436
4. German Wonder . . . . .	386
5. Yandilla King . . . . .	249
6. Sailor's Fortune . . . . .	239
7. Walker's Wonder . . . . .	168
8. Late Gluyas . . . . .	147
9. College Purple . . . . .	120
10. Federation . . . . .	115
11. Moira . . . . .	95
12. Dart's Imperial . . . . .	47
13. White Tuscan . . . . .	30
14. Correll's . . . . .	4
15. Florence . . . . .	3

*Varieties of Oats.*

1. Algerian . . . . .	359
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## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

### REPORT OF THIRTY-SECOND ANNUAL CONGRESS.

*(Continued from page 311.)*

#### RE-AFFORESTATION.

The following paper was read by Mr. P. J. Curnow (Wirrabara Branch):—

Probably at no time in our history has the question of national afforestation attracted so much attention at the hands of the general public than at the present time. As a result of the war, all timber values are so high that the average citizen—and especially those who contemplate building operations—has had the fact impressed upon him that any country depending upon outside sources of supply, must pay the penalty for not having made provision for a home-grown commodity in the long years of peace. The nation that is in the happy position to be an exporter of commercial timber at the present time is reaping a rich reward, as a result of either the wise conservation of its natural timber resources, or through the display of statesmenlike foresight in the planting of suitable varieties of trees in the years gone by.

In our own State, the question of planting commercial timber-producing trees has always been regarded as a purely State matter. The private citizen has failed to realise that such a practice would prove a valuable asset in the years to come; and has refrained from planting even small areas in those localities where climate was suitable and land available, particularly in the latter connection, where large holdings would readily provide an acreage that could be spared to such a purpose without immediate loss. The principal reason, even at the present time, for the non-sinking of capital in such an undertaking, is to be found in the fact that the planting of trees means the laying aside a certain sum, without any reimbursement, over a long term of years. Naturally an investor looks for some financial return within a reasonable time. Unlike the private individual, the State can afford to wait, seeing that an annual planting of large numbers of trees means eventually a continuous revenue, which rapidly overtakes the expenditure on such work, once the trees reach a commercial value. In this connection the history of our State Forest Department goes to show, that in the early days, various niggardly Governments so failed to realise the necessity for extensive planting operations, that the annual Forestry vote was so small that only very limited areas could be planted each year. In spite of this fact progress has been made, and to-day the Department is proving a sound and paying proposition. In the past two years the sum of £45,000 has been earned, mostly as the result of timber sales from trees planted in the past. If proof were needed that the planting of suitable trees—especially the quicker

maturing pines—by the private citizen is a paying proposition, the following facts may be cited:—

When the Forest Department put down its first sawmill in the writer's district (Wirrabara Forest) eighteen years ago, a block of *Pinus insignis* growing in the Forest nursery was cut down. The trees had been planted 16ft. apart, and were 27 years old. The largest one cut 210 fruit cases, which were sold at 1s. each; and many others were nearly as large. Furthermore, the contract completed last year by Messrs. Lewis & Reid, in the Whyte Park plantations, goes to prove the value of timbered areas at the present time. In this case, the Forest Department called for tenders for the purchase of certain pine plantations of *Pinus insignis*, and the above firm secured the tender for the supply of 5,000,000ft. gross. The firm paid the Department over £25,000 royalty, the State railways £5,000 for freight to the city, and disbursed about £3,000 in wages and for horse feed, &c., a total of £33,000; and the remarkable fact about the whole proposition is the statement that all this wealth was produced on an area between 75 and 79 acres in extent. Can any delegate to this Conference show such a return for such an area for any agricultural commodity? These trees were over 30 years old average. One block was nearly 40 years old.

With such facts before one, can any landholder, who contemplates planting on even a moderate scale, argue that there is no profit in tree planting even after all the years of waiting? If any delegate wishes to make provision for those coming after him let him at once plant, say, 500 *Pinus insignis*, for choice, if his locality is suitable for such a purpose. When the land is prepared one man can plant such a number easily in five days, and in 25 years a substantial reward will be for him or his posterity. Where such large areas have been denuded of their useful and matured timber, as in the Adelaide hills, and certain other localities, the owners should seriously consider the question of either regenerating the natural timber, if such is of first-class commercial value (as for instance in the case of the stringy bark), or the planting of other trees suited to the various localities. Without any doubt, the various types of pines offer an excellent selection of proved suitable kinds. Where the denuded country is rough, natural regeneration of local useful timber is the cheapest method to adopt. If such areas are burnt over at a safe time of the year, say, in early autumn, and are then shut off from all stock and protected against rabbits, and provision made against bush fires, a strong growth of young indigenous trees will soon appear. If fully protected for about five years, the saplings will be large enough to take care of themselves. If judicious thinning be carried out, a valuable growth of timber will result. The grazing of stock over such areas, when trees are out of reach, will provide immediate revenue. Where such denuded land is arable and can be broken up by ploughing at a reasonable cost, the writer urges upon the owner the wisdom of planting quicker growing pines in preference to the slower moving indigenous varieties of trees. Seeing that our State Forest Department provides the trees gratuitously, and in several varieties, no expense need be entailed in that direction. After the land has been securely fenced, particularly against rabbits

(a pest that will ruthlessly destroy large numbers of pines in a short time), plough the area deeply and harrow down the rough surface. Mark out rows at least 12ft. apart, and 16ft. if land can be spared. Plant an equal distance between the trees in the rows. Where the area is comparatively small, keep the young trees well hoed after rain throughout the first season, and if practicable, dig around the trees the second year, but not too deeply. After that the owner will find that they can quite take care of themselves. The keeping out of all stock for, say, four, or better still, five, years, will give the young plantation every chance.

Where danger from fire in the summer months is likely, it will be a wise policy to follow the excellent plan adopted by the Forest Department over 40 years ago (and still carried out annually); of ploughing wide breaks around and through plantations at regular intervals. In case of fire, this plan not only helps to confine the blaze, but gives fire-fighters a chance to combat the outbreak.

Grave errors have been made in the past, not only by private citizens, in the matter of ruthlessly destroying valuable timbered areas, but by the State, in alienating large tracts of country not only specially suitable to afforestation purposes, but land already carrying large quantities of mature and useful timber. In the writer's own district, such a mistake was made twenty years ago, and revenue that should have gone to the State has been reaped by those, who neither planted or intended to plant, where useful timber has been removed. In many parts of the North quite valuable native pine forests were destroyed in the early days by landholders who failed to realise the value of such timber in the future. Even small areas, in too many cases, were not left, and to-day many of the present holders of such land have to haul domestic supplies of wood considerable distances. To such, the suggestion is made that an effort be put forth to replenish timber supplies. Such a tree as the sugar gum will prove a quick grower, and will in a few years, in favorable localities, provide useful farm timber; and also firewood. Where experiment has already proved that only the local native timber will thrive through adverse climatic conditions, if such timber is of a useful character, the plan of wholly protecting a suitable area for a few years, is certainly worth trying. In many outlying districts, the question of planting useful trees to take the place of some of our more worthless kinds, is a difficult one, for so many of the valuable kinds thrive only where the conditions are just right. Without any doubt our native pines will thrive when many other trees would die. As this tree is a quick grower, and provides good wood for many purposes, it is worth a trial in those districts where it is not indigenous.

In conclusion, as citizens, we must always remember that we have no right to use up nature's bounteous supplies without making provisions for their replenishment. Those coming after us have an equal right with ourselves to enjoy the beauties of nature so lavishly provided, and a claim on our attention to-day in the matter of re-planting where we destroy.

Mr. J. C. Catt (Mallala) said early in the year he had taken a motor trip through the River districts and his attention had been drawn to the wanton destruction of trees carried out by the State. In a few years' time, the settlers would be crying out for firewood. A provision should be made that on each block of no less than half an acre of timber should be left standing for shelter for the stock and firewood. Mr. Mann (Younghusband) said that practically the only two useful timbers that grew along the river were the Box gum and the Native pine. After each flood thousands of young trees came up and the supply of timber could be maintained if these trees were protected from cattle and allowed to grow. A few years ago thousands of Native pines could be seen growing on the slopes of the Murray, but at the present time they were almost extinct. Mr. J. S. Hammatt (Lyndoch) said the matter of afforestation was one that could not be dealt with too seriously. Near Mt. Crawford thousands upon thousands of tons of first-class wood was going up in smoke, and the same could be said of many of the settlements along the river. He then moved— "That we, the delegates of this the 32nd Annual Congress, pledge ourselves to discuss the subject of afforestation at our Branch meetings during the ensuing year." Mr. J. W. Winch (Big Swamp) seconded, and suggested that the Government might be requested to prevent the ring-barking of the timber along public roads. On the motion of Mr. A. Tonkin (Cadell) seconded by Mr. H. S. Taylor (Renmark) it was resolved—"That this Congress emphatically protest to the Government against the wicked and wilful waste of timber in this State, and particularly along the River Murray." Mr. F. Coleman (member of the Advisory Board) congratulated Mr. Curnow on the good paper he had submitted to the Congress. He hoped that something would arise out of the resolutions that had been passed that would strengthen the hands of the Advisory Board, because it was important that something should be done with the vital question of afforestation without any loss of time. The Superintendent of Experimental Works (Mr. W. J. Spafford) said exceptionally good results had been obtained at the Booborowie Experimental Farm by broadcasting the seeds of the native timbers. The main thing was to protect the young trees from being destroyed by stock and rabbits. Capt. S. A. White (member of the Advisory Board) said he had always been a very strong advocate of afforestation, and he had done everything that he possibly could for the preservation of the timber along the River Murray. It was high time that people realised what a folly was being committed in the ruthless destruction of timber that was being carried on all over the State. From the very keen interest that had been shown by all in Mr. Curnow's paper, he believed a step in the right direction for the preservation of the native timbers had been commenced in South Australia.

#### Afternoon Session.

The Secretary of the Advisory Board (Mr. H. J. Finnis) announced that a communication had been received from the secretary of the Y.M.C.A. intimating that the committee of the organisation had extended a very kind invitation to all delegates to become honorary members of Y.M.C.A. during Show Week.

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## COMPULSORY REGISTRATION OF SIRES.

[An Act to compel all owners of Stallions and Bulls to register under the same conditions as the Victorian Act, No. 3040, cited as the "Horse Breeding Act of 1919."]

The following paper was read by Mr. J. H. Dawkins (Gawler River):—

Briefly the Act is as follows:—No male horse or donkey, not wholly castrated after it has reached the age of two years, shall be allowed to mate with females until it has been inspected by a veterinary officer in employ of the Department of Agriculture. This officer shall either condemn the animal for twelve months or for all time. Again, if the animal reaches the approved standard in conformation and is sound, then the Government will issue a certificate of registration in respect of such stallion in the form prescribed. Any person who uses a stallion for stud purposes after it has been refused a certificate of registration shall be fined, and the Government shall deal with the horse as they see fit. As far as horse-breeding in South Australia is concerned, this last item is the one that affects us in a very grave manner. The Victorian Government have thought it expedient to pass this law, not allowing stallions, which do not conform to a certain high standard, to be used in their own State, but in substance say to the owners, "You can sell them in South Australia or elsewhere." The result is that South Australia becomes a dumping-ground for all the horses in Victoria that cannot be registered. The Horse Societies in South Australia are of the opinion that we should have legislation passed to prevent horses that cannot be registered coming into the State. This will never be an effective way of dealing with the trouble. If these horses are detrimental to our own State, then our own horses of the same class must also be detrimental. To deal effectively with this matter then, we must have legislation similar to the Victorian Horse-breeding Act of 1919. At the same time, this legislation could deal with scrub bulls. Firstly—I want everyone to remember that the minor details that we may discuss to-day are not important, for after all Parliament is the place where the law is made. The question is, "Do we want registration or do we not?" Twelve years ago I wanted to get this Congress to agree to a resolution to the effect that after seven years all stallions without a certificate of soundness should be operated on. The Congress agreed to this with the exception of the seven years' limit, and, in place of that, they inserted one year. So we are in the position of twelve years ago. Secondly—One of the reasons why we want this legislation more to-day than ever before is that the wealthy station owners, who used to import horses and cattle of the highest type, are fast disappearing, if not gone altogether—men like the late Mr. J. H. Angas, Mr. Hack, Mr. Tate, Mr. Porter, and Mr. Murray, who brought the very best stock from the older countries irrespective of cost. We have much to thank these men for, and had we had some system of registration, the business of these enthusiasts would have paid them instead of being merely a hobby. Fancy one of Mr. Angas' stallions being sold for £40, and some imported bulls of good strain at under £20. To-day

cattle prices are very good, and are paying the breeders, but what is happening? Men are selling bull calves from any common cows because the father was bred by one of Butterfield's best bulls. Unless we give these breeders some protection, they will be undersold by half-bred brutes, and the breeders of pure stock will be hard hit. Thirdly—We raise the standard of our own stock more rapidly by this means than any other we could adopt, because no matter how ignorant or careless a man may be, he must use an animal of an approved standard. As the male exerts half the influence on the progeny, it is only a matter of a few generations before we have raised our stock to a standard that even our Governor might be proud of. We have individual cases of horses and cattle as good as you will find in Australia, but the bulk, alas! what do we see? There is no legislation in the world, that I can find, in regard to cattle on these lines, and very little with horses on exactly the same lines, but in some countries, France for instance, it is very stringent. The ideal, that we may hope to attain, would be that the stallion should be of pure breed, conform to a certain standard of excellence, and be sound. If, in the future, we are enabled to secure this legislation, then the breeder's task will be easier, as he will know what is wanted, and will be enabled to profit financially by it. In cattle the ideal, which should, and in the future I hope will, be realised, is that the bull must be pure bred and come from deep-milking cows for at least four (4) generations. That is the ideal. At present it is suggested that the Government introduce legislation on similar lines to the Horse Breeding Act of Victoria, and that the approved standard mean a pure-bred bull or bulls from deep milking cows, even if they are only grades. The only difficulties that I can see are in the event of young stock being cast out, especially at five years of age. Take a stallion. If the breeder keeps him until he is five years of age, then the price he would want would be very large, or else it would pay him better to geld the animal. If it is sold at three years old, and then at four is refused a certificate, its value may fall from £200 to £20. This happened twice to the same buyer in Victoria, and, undoubtedly, is a great hardship. The same thing may apply to the raising of bull calves. This can only be met by a form of insurance, which should be helped by the Government for the first five years. Alternatively, five years' notice, that this Act will come into force, could be given. In conclusion, let me say we do not want half measures or spoon-feeding. The Government has been letting out bulls to Branches of the Agricultural Bureau, and yet the results have been almost nil. The farmers have reached a stage in the history of this State when all the old settled areas can well afford to pay the high fee charged for the service of a pure stallion or bull, which the Government must compel them to do for their own good and the advancement of the State. So we may attain to the ideal by using only stock that will improve those three-cornered cattle and scrubby horses, when to see good stock will be the rule and not the exception.

Mr. W. H. Lang (Virginia), in opening the discussion, said that by doing away with the scrub bulls a good deal would have been accom-

plished in building up the standard of the herds of the State. Mr. J. Smith (Hawker) could not see the force of a veterinary surgeon failing to grant a horse a certificate of soundness, while at the same time the horse was allowed to travel in the district. If legislation was brought in, in conformity with the suggestions contained in the paper, it would be impossible for a person to keep a horse that did not pass the examination. Referring to cattle, the speaker said that some of the best milk-producing cows they had in his district were those sired by the pure bred bulls that had been obtained from the Department of Agriculture. A delegate from Black Springs Branch thought that farmers should be allowed to shoot scrub bulls when they were found straying about on other people's property. Mr. E. H. Parsons (Pinnaroo) did not think any measure too stringent to overcome the scrub bull problem. It was quite possible that there would be a few who would object to registration, but the majority of the agricultural community would be very strong for the adoption of the measure. The Director of Agriculture (Professor Arthur J. Perkins) said he would like to see eliminated the proposal that bulls from deep milking cows, even if they were only grades, should come within the approved standard. Mr. W. S. Kelly (member of the Advisory Board of Agriculture) said legislation along the lines set out in the paper was at present being framed. There was going to be registration of bulls in the same way as there was for dogs. Many bulls were allowed to remain entire simply because people were too lazy to cut them. The registration of the bulls would prove a good thing for the dairying industry. Mr. Dawkins then moved and Mr. E. H. Parsons (Pinnaroo) seconded "That this Congress is in favor of the Government bringing in an Act to provide that owners of stallion and bulls should register their animals under the same conditions as exist under the Victorian Act." The motion was carried.

On the motion of Mr. J. Brown (Port Elliot) seconded by Mr. H. Hunt (Mount Barker) a hearty vote of thanks was accorded to the officials of the Y.M.C.A. for their kindness in offering the delegates the conveniences of the institution.

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## MURRAY BRIDGE HERD TESTING SOCIETY.

## RESULTS OF BUTTERFAT TESTS FOR AUGUST, 1921.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during August.	Per Cow during August.	Per Cow October to August.	Per Herd during August.	Per Cow during August.	Per Cow October to August.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/A	13	12.48	10,652.5	819.42	6,331.96	522.50	40.19	300.83
1/B	16	10.19	6,669	416.81	5,847.78	286.65	17.92	261.11
1/C	45.68	38.16	32,938	721.10	6,381.16	1,326.15	29.03	262.51
1/D	18	18	11,036	613.11	5,477.16	556.72	30.93	271.91
1/E	15	11.45	7,828	521.87	5,863.07	368.30	24.55	279.87
1/F	11	9.81	7,495.5	681.41	5,498.04	309.14	28.10	229.74
1/G	51	41	34,947.5	685.25	8,681.74	1,458.98	28.61	334.48
1/H	16.03	14.26	10,050	626.86	5,352.62	434.52	27.10	234.82
1/I	11	6.26	5,775	525.00	6,523.51	228.56	20.78	274.47
1/J	16	9.90	6,392.5	399.53	6,402.33	281.30	17.58	291.43
1/K	13	7.65	4,259	327.62	5,595.15	208.89	16.07	254.77
1/L	13	10	8,094	622.62	5,609.97	380.97	29.31	258.72
1/M	14	9.97	4,860	347.14	4,182.48	238.56	17.04	200.55
1/N	—	—	—	—	2,301.68†	—	—	100.07†
1/O	33	28.35	21,760	659.39	4,577.27*	1,026.27	31.10	212.96*
1/P	18	13.68	7,804.5	433.58	4,080.71*	363.59	20.20	187.07*
1/Q	—	—	—	—	1,241.91‡	—	—	49.01‡
1/R	15	15.00	8,246	549.73	2,308.69§	397.00	26.47	111.98§
Mean	19.92	16.01	11,800.47	592.41	6,222.91	524.26	26.32	270.90

† For four months only (withdrew from society).  
 ‡ For four months only.

‡ For two months only (withdrew from society).  
 § For four months only.

## MURRAY BRIDGE HERD TESTING SOCIETY RESULTS.

The first year's operations of the Murray Bridge Herd Testing Association were completed on September 30th, 1921, and the Minister of Agriculture (Hon. T. Pascoe, M.L.C.) has announced that the following prizes have been awarded by the Government:—

*First Prize*, £75, to Mr. J. A. Halliday, of Murray Bridge, whose average output per cow for 12 months was 939.21galls. of milk and 364.29lbs. of butter fat. The average number of cows in Mr. Halliday's herd was 46.

*Second Prize*, £25, Mr. B. H. Green, of Monteith, the average output of whose herd per cow was 710.85galls. milk and 337.15lbs. butter fat. The average number of cows in Mr. Green's herd was 12.

*Third Prize*, £10, Mr. G. G. Hall, of Mypolonga, the average output of whose herd per cow was 680.17galls. of milk and 308.72lbs. of butter fat. The average number of cows in Mr. Hall's herd was 16.

## MURRAY BRIDGE HERD TESTING SOCIETY.

## RESULTS OF BUTTERFAT TESTS FOR SEPTEMBER, 1921.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during September	Per Cow during September	Per Cow October to September (Final corrected figures.)	Per Herd during September	Per Cow during September	Per Cow October to September (Final corrected figures.)
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/A	13-90	12	10,116	727-77	7,108-50	472-24	33-97	337-15
1/B	16	9-3	6,669	416-81	6,211-13	297-99	18-62	277-53
1/C	46	38-94	35,237	766-02	7,155-30	1,469-87	31-95	294-79
1/D	18	18	10,320	573-33	5,995-79	477-23	26-51	295-55
1/E	15	10-17	7,500	500-00	6,362-95	360-57	24-04	303-98
1/F	11	8-37	6,517	592-45	6,090-50	270-18	24-56	254-32
1/G	51-43	37-47	37,931	737-48	9,392-05	1,516-92	29-49	304-29
1/H	17	15-83	13,075	769-12	6,160-61	550-76	32-40	268-73
1/I	10-23	6-13	6,325-5	618-13	7,273-43	261-30	25-53	303-30
1/J	16	7-63	6,470	404-38	6,801-67	281-27	17-58	308-72
1/K	13	8-00	6,659	512-23	6,129-06	294-46	22-65	277-92
1/L	13	11-67	8,850	680-77	6,294-14	408-35	31-41	290-05
1/M	14-68	11-53	7,005-5	477-30	4,694-12	337-42	22-99	223-61
1/N	—	—	—	—	2,301-68†	—	—	100-07†
1/O	33	30	21,060	638-18	5,270-71*	1,053-03	31-91	247-97*
1/P	18-97	16-47	10,693-5	563-80	4,657-38*	471-67	24-87	211-58*
1/Q	—	—	—	—	1,240-16‡	—	—	48-95‡
1/R	15-67	15-67	7,515	479-68	2,750-04§	359-20	22-93	133-03§
Means	20-18	16-07	12,621-47	625-44	6,853-16	555-15	27-51	298-63

† For four months only (withdrew from society.)

\* For 10 months only.

‡ For two months only (withdrew from society.)

§ For five months only.

NOTE.—Further statements showing total production by the society will be published next month.

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finely ground will greatly benefit your fruit trees or vines.

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## OATS AS A FOOD FOR PIGS.

Although, as a rule, oats are preferably fed to horses, cattle, or sheep, I see no good reason why they should not be fed with advantage to pigs when other avenues are closed says the Director of Agriculture (Professor Arthur J. Perkins). As to whether this can be done profitably or not will depend, of course, on the current market value of oats and on the price that can be realised for pigs fed on them. Feeding pigs on oats alone is hardly to be recommended, except, perhaps, when fattening-off old sows. For younger pigs, particularly for growing ones, some more highly nitrogenous foodstuffs should be associated with oats. If grazing, particularly leguminous grazing (lucerne, clovers, &c.), is available, no addition will be needed. I suggest the following oat ration for pigs of various ages and sizes:—

*For Young Growing Pigs, 40lbs. to 80lbs. in Weight.*—If oats alone are fed, daily requirements would be represented by 2½lbs. to 5lbs. according to sizes. The oats should either be crushed or soaked over night in no more hot water than they would absorb. They should be given, preferably, in three meals. The above figures presuppose the oats to be first quality; if inferior, quantities may have to be increased.

The following, however, represent far better rations for young pigs and are recommended:—

Ration 1—	40lb. Pig.	80lb. Pig.
Crushed oats . . . . .	2lbs.	4lbs.
Skim milk . . . . .	2½lbs.	5lbs.
Ration 2—		
Crushed oats . . . . .	2lbs.	4lbs.
Abattoir's pig meal . . . . .	½lb.	½lb.

*For Fattening Pigs, 120lbs. to 160lbs.*—Again, if oats alone were fed, daily requirements according to size would be 6lbs. to 8lbs. with sufficiency of green feed if available. But there is nothing to be gained in stinting fattening animals; the main object in view is to fatten them off as rapidly as possible. They must absorb a definite amount of food to reach market condition, and it is more economical that this food should be consumed in a short rather than in a long period of time. Waste, however, should naturally be avoided and animals fed according to their appetites and ability to clean up their feed-boxes.

In preference to oats alone, and in the absence of other available material, the following rations may be recommended:—

Ration 1—	120-pounder.	160-pounder.
Oats . . . . .	5lbs.	7lbs.
Skim milk . . . . .	5½lbs.	8lbs.
Ration 2—		
Oats . . . . .	5lbs.	7lbs.
Abattoir's pig meal . . . . .	½lb.	½lb.

## ORCHARD NOTES FOR SOUTHERN DISTRICTS.

[By C. H. BEAUMONT.]

Do not forget to spray the apple and pear trees with arsenate of lead; use the powder form, 1lb. to 30galls. of water, and thoroughly coat the fruits.

Thrip is very often a nuisance at this time of the year; the best remedy is a weak lime-sulphur solution with some "black leaf 40" mixed with it.

Young trees require attention during hot spells; see that the soil is kept loose about them, and, if necessary, give them a few gallons of water.

Trees which have been grafted should be watched, and all growths from the old stock removed. It is also easy to rub off, or remove with a sharp knife, any new growth not required. The same applies to grafted vines, also to trees which have had limbs cut back. A few minutes given to a tree now will save hours in the winter, and will put all the growth where it will do some good. Trees cut back for budding should be treated in the same way.

Watch for borers in apricot and almond trees and, at times, plums: the borings or sawdust show where the grub has entered. Take a bit of cotton wool about the size of a pea, soak it in petrol and push it into the hole, plug the hole with clay.

There are often reports of apricots trees dying early in the season: it is difficult to account for it as the trees seem to start their growth splendidly. The cause mostly is that the tree has been too wet in the wintering. It has actually been drowned, but seems to have the energy stored within it to be able to send out the first buds, and then collapses. On digging up the tree it appears to be healthy, but if a close examination is made of the ends or growing tips of the main roots, it will be found that they are black and rotten; this is caused by standing in water. Stiff clayey soils hasten the decay.

Try the effect of more careful grading of fruit before marketing. So many growers give every attention to produce good fruit, and then lose the best prices by inferior and unsightly packing.

### FEEDING LUCERNE AFFECTED WITH LEAF SPOT.

Providing that the hay made from the lucerne crop which is affected with "leaf spot" only forms part of the feed given to milking cows, it should not have an injurious effect on the animals, says the Superintendent of Experimental Work (Mr. W. J. Spafford) in reply to a correspondent. It would be wise to use good cereal hay in conjunction with this affected lucerne hay in the proportion of about two of cereal hay to one of lucerne hay, being certain to use the two kinds together and not to feed the lucerne hay by itself.

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## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on December 1st, 1921:—

**BUTTER.**—The season has been a most bountiful one, and record quantities have come forward. Unfortunately the London market has been most depressed, and buyers have been very chary in their operations, so that heavy parcels have been shipped on consignment. Latest reports state that owing to the heavy quantities to hand and to arrive in London, market rates there are likely to be lower. There is a good demand for first grades, but other qualities have found a dragging sale. At the close of the month values were:—First grade factory and creamery fresh butter in prints, 12½d. to 13d.; best separators and dairies, 11d. to 12d.; fair quality, 9½d. to 10d.; well-conditioned store and collectors', 9d. to 9½d.; weather-affected lots, slow of sale, 8d. to 8½d.

**EGGS.**—Supplies have kept up remarkably well, values showing a slight easing owing to some picklers and pulp manufacturers having secured their requirements. At end of month fresh hen sold at 10d.; duck, 10½d.

**CHEESE.**—Consignments coming forward from the South-Eastern factories have been very substantial, and values in consequence are a shade easier. The *Middlesex*, which is leaving Adelaide on December 5th, is taking big quantities of cheese to London, and this will relieve the market somewhat. Present prices are 6d. to 7d. for large to small sizes.

**HONEY.**—New season's is now coming on the market, quality of which is opening out very nicely. Demand is fairly good for this line, even second-grades finding a better outlet. Prime clear extracted, at close of month, was selling at 3d. to 3½d.; second-grades, 2d.; beeswax, 1s. 7d. to 1s. 8d.

**ALMONDS.**—Have been a very scarce line, forwardings during the month being not nearly equal to trade wants, Brandis selling at 13½d.; mixed softshells, 12½d.; hardshells, 6d.; kernels, 2s. 4½d. to 2s. 5d.

**BACON.**—Demand has been rather good, and supplies quite equal to trade requirements. Hams are in nice request, buyers operating in anticipation of Christmas trade, best factory-cured sides selling at 13d. to 13½d.; hams, 1s. 5d. to 1s. 6d. Lard in packets, 8½d.; bulk, 8d.

**LIVE POULTRY.**—Quantities coming forward are quite in keeping with Christmas sales. The pleasing feature is that the demand readily clears all offering. Competition has been exceptionally keen, and very satisfactory prices have ruled, especially for quality lots. To facilitate deliveries we are holding daily sales during this month, so that consignors can send on at any time, and we would advise them sending on early, as buyers are already operating and putting away in cold store for Christmas. At end of month prices were:—Prime roosters, 5s. to 7s.; nice-conditioned cockerels, 4s. to 4s. 9d.; plump hens, 3s. 6d. to 5s.; light birds, 2s. to 3s. 3d. (couple pens weedy sorts lower); ducks, 2s. 8d. to 7s. 3d.; geese, 6s. to 7s. 3d.; turkeys, prime conditioned, 1s. 2d. to 1s. 6d. per lb. live weight; fair conditioned, 1s. to 1s. 1½d. lb; fattening sorts, lower; pigeons, 8d.

**POTATOES.**—Supplies of local new potatoes came along fairly freely at the beginning of the month, but latterly quantities have not been so heavy. There has been a strong demand for them, and old potatoes are in very little request. A few small shipments have been landed from Western Australia, and the quality has proved satisfactory. At close of month quotations for local new potatoes were from 12s. to 13s. per cwt. on trucks Mile End.

**NEW ONIONS.**—7s. to 8s. per cwt. on rails Mile End.

## THE AGRICULTURAL OUTLOOK.

### REPORTS FOR THE MONTH OF NOVEMBER.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

**Booborowie.**—Weather—The first part of the month was exceedingly hot, and chiefly characterised by fine weather, and from the 19th to the time of writing moderately cool to very cold weather was prevalent for this time of the year. Crops—So far as quantity of straw is concerned, the crops are good, but what the yields of grain will be is difficult to pronounce at present, owing to the detrimental effect of the intensely hot weather. In a few instances crops are nearly ripe. Natural feed is abundant and more plentiful, I think, than has been the case for several years. Stock are all in good condition. Pests—There are noxious weeds of many species on the holdings, and equally as many on the public roads, and in both cases in many instances too numerous to destroy. Miscellaneous—Haycutting is completed, and in a few isolated cases barley and oats are being harvested. Grasshoppers have arrived, but up to the present I have not heard of any damage having been done by them.

**Eyre Peninsula.**—Weather—61 points rain extended over month during five different days. Month commenced warm, but latter part dull, and poor harvesting weather. Crops—Harvesting in full swing, but hindered during last week with unfavorable weather. Crops not yielding up to expectations, there being considerable amount of pinch grain. Red rust has done considerable damage in district, but has not affected crops on this farm. Natural Feed—All dried off, but still an abundance of dry feed, which should be favorable for burning this year, provided we escape thunderstorms. Stock—All in good condition and free from disease. Pests—Rabbits still numerous in areas where there is any available water in the vicinity. Miscellaneous—Farmers still knocking down an amount of scrub in district, and all very much disappointed with wheat yields. Orchard on farm and olives looking splendid.

**Kybybolite.**—Weather has been exceptional for the time of year. A nice rain fell early in the month, and a good half-inch fell a week later; then followed an extremely hot period. This broke at the end of the month with a heavy stormy rain, with very cold winds. Altogether 324 points were recorded for the month, i.e., 2in. above the average. Cereals ripened off very quickly with the hot weather; this, followed by rain, has spoilt the sample of hay. Summer fodder crops are benefitting much by the conditions, kale, turnips, maize, and sunflowers making good growth. Pests—Caterpillars have arrived in myriads during the month, and have made havoc of the oat and pea crops.

**Turretfield.**—Weather—The weather has been very changeable; hot, drying winds and cool, damp spells in between. Rainfall for month, 192 points. Crops have dried off badly; it was thought that rust would do much damage to the crops, but the hot winds withered the crops up badly and did much more damage than rust was likely to do. The grain will be badly pinched. Natural feed has dried off. Stock on the whole is in good condition; young poddies are numerous, and are showing signs of needing a certain amount of handfeeding to give them good development. Pests—A few grasshoppers are showing, but so far are doing little harm. Miscellaneous—Haycutting is practically finished; a large area has been cut; the yield is fairly bulky, but will weigh light.

**Veitch.**—Weather—Have experienced very changeable weather during the past month—heavy winds with light rain, also a few very warm days. Have received 100 points of rain for month. Crops—Hay harvesting is nearing a finish in this district, and the cut was rather short compared with previous years. Stripping operations have started, and the sample is showing better than expected. Natural feed is drying off, but a good supply seeded. Stock are all in healthy condition. Pests—Rabbits are doing a fair amount of damage.

## EGG-LAYING COMPETITION, 1921-1922.

HELD AT THE PARAFIELD POULTRY STATION, PARAFIELD, UNDER THE DIRECTION  
OF D. F. LAURIE (GOVERNMENT POULTRY EXPERT AND LECTURER).

Total No. of Pens.—Section I, Light Breeds (Single Testing), 24—3 pullets in each entry. Section II, Heavy Breeds (Single Testing), 13—3 pullets in each entry. Section III, Light Breeds, 25—6 pullets in each pen. Section IV., Heavy Breeds, 9—6 pullets in each pen.

TWELVE MONTHS' TEST. TO START ON MARCH 1st, 1921, AND TO TERMINATE ON FEBRUARY 28th, 1922.

## SECTION 1.—LIGHT BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENTRY.

Row No.	Name and Address.	Bird No.	Month ending 30/11/21.	Score to Date.	Bird No.	Month ending 30/11/21.	Score to Date.	Bird No.	Month ending 30/11/21.	Score to Date.
WHITE LEGHORNS.										
E	Bamford, W. H., 74, Adelaide Road, Glenelg	1	25	108	2	25	169	3	26	134
E	Connor, D. C., Gawler .....	4	25	137	5	23	137	6	—*	—*
E	Willington, Mrs. G., Milang ....	7	25	153	8	18	79	9	22	138
E	Nancarrow, J. T., Plympton ....	10	24	113	11	20	97	12	25	124
E	Broadview Poultry Farm, Seaton Park	13	23	131	14	22	121	15	23	122
E	Stevens, H. J., Broken Hill.....	16	25	108	17	20	96	18	23	112
E	Monkhouse, A. J., Woodside.....	19	18	60	20	16	120	21	25	159
E	Turvey, D. J., Milang .....	22	25	110	23	27	113	24	22	92
E	Lampert, Mrs. S., Piccadilly ....	25	23	117	26	24	119	27	21	85
E	Nancarrow, J. T., Plympton ....	28	19	133	29	24	134	30	23	111
E	Small, E. W., Mount Gambier ...	31	22	126	32	23	129	33	21	101
E	Coleman, A. C., Grange .....	34	26	122	35	—*	—*	36	27	131
E	Broadview Poultry Farm, Seaton Park	37	24	140	38	23	114	39	24	123
E	Holmes, F. A., Naracoorte .....	40	19	95	41	25	125	42	22	127
E	Lampert, Mrs. S., Piccadilly ....	43	24	166	44	—*	—*	45	24	121
E	Green, F. W. H., Monteth .....	46	17	91	47	19	131	48	18	87
E	Howie, H. H., Mount Gambier ..	49	18	113	50	21	112	51	12	102
E	Willmott, H. J., Clarence Park ..	52	20	87	53	15	62	54	—*	—*
E	Stockman, A., Goodwood .....	55	23	126	56	—*	—*	57	21	87
E	Green, A. J., Crystal Brook .....	58	19	129	59	12	100	60	19	132
E	Herbert, C., Alberton .....	61	20	87	62	19	124	63	16	104
E	Blake, Mrs. B. L., Berowra, N.S.W.	64	Dead		65	21	138	66	25	129
F	Tilly, P. N., Balwyn, Victoria ...	1	26	126	2	—*	—*	3	—*	—*
F	Dugan, T., Lower Light .....	4	26	169	5	24	160	6	23	156
Totals .....		—	516	2,807	—	421	2,380	—	462	2,477

## SECTION 2.—HEAVY BREED (SINGLE TESTING). THREE PULLETS EACH ENTRY.

## BLACK ORPINGTONS.

F	Lampert, Mrs. S., Piccadilly ....	7	—*	—*	8	—*	—*	9	19	163
F	Shaw, R. R., Crystal Brook .....	10	25	120	11	—*	—*	12	—*	—*
F	Farr, K. H., Fullarton Estate .....	13	27	187	14	25	182	15	21	133
F	Alford, T., Broken Hill .....	16	—*	—*	17	—*	—*	18	15	207
F	Lampert, Mrs. S., Piccadilly ....	19	—*	—*	20	12	169	21	Dead	
F	Holmes, F. A., Naracoorte .....	22	2	95	23	15	109	24	14	105
F	Shaw, R. R., Crystal Brook .....	25	16	103	26	9	85	27	18	78
F	Wheaton, S. P., Bute .....	28	26	156	29	Dead		30	16	109
F	Bansemmer, Mrs. B., Beaumont ...	31	—*	—*	32	—*	—*	33	—*	—*
F	Farr, K. H., Fullarton Estate .....	4	25	198	35	—*	—*	36	25	200
F	Mortimer, G., Broken Hill .....	37	21	178	38	26	178	39	—*	—*

\* Failed under Regulation 12.

## SECTION 2.—HEAVY BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENTRY.

Row No.	Name and Address.	Bird No.	Month ending 30/11/21.	Score to Date.	Bird No.	Month ending 30/11/21.	Score to Date.	Bird No.	Month ending 30/11/21.	Score to Date.
RHODE ISLAND REDS.										
F	Stockman, A., Goodwood .....	40	—*	—*	41	23	118	42	21	98
F	Tester, G., Naracoorte .....	43	—*	—*	44	24	107	45	7	57
Totals .....		—	142	1,037	—	134	948	—	156	1,150

## SECTION 3.—LIGHT BREEDS (PEN TESTS). SIX PULLETS IN EACH PEN.

Pen No.	Name and Address.	Breed.	Eggs Laid for Month Ending 30/11/21.	Total Eggs Laid from 1/3/21 to 30/11/21.
1	Anderson, S., Gawler Railway .....	White Leghorns .....	118	913
2	Pugaley, A., Hindmarsh .....	" .....	64	459†
3	Connor, D. C., Gawler .....	" .....	127	809
4	Willington, Mrs. G., Milang .....	" .....	124	747
5	Norton Bros., Seaton Park .....	" .....	120	683
6	Nancarrow, J. T., Plympton .....	" .....	93	611†
7	Small, E. W., Mount Gambler .....	" .....	118	782†
8	Buchan, J. S., Seaton Park .....	" .....	143	898
9	Anderson, J., Prospect .....	" .....	130	677
10	Pugaley, A., Hindmarsh .....	" .....	77	561
11	Alford, T., Broken Hill .....	" .....	—	—*
12	Pool, F. J., North Norwood .....	" .....	118	726
13	Nancarrow, J. T., Plympton .....	" .....	120	842
14	Smith & Gwynne, Gawler South .....	" .....	133	822
15	Ratten, C. A., Mile End .....	" .....	120	827
16	Howie, H. H., Mount Gambler .....	" .....	132	923
17	Willmott, H. J., Clarence Park .....	" .....	124	621
18	Anderson, Wm., Kapunda .....	" .....	126	846
19	Herbert, C., Alberton .....	" .....	125	775
20	Sparrow, F. H. L., late A.I.F., Beverley .....	" .....	120	866†
21	Clee Hill Stud Poultry Farm, Box Hill, Victoria .....	" .....	107	757
22	Beytheim, E. W., Scott's Creek .....	" .....	121	746
23	Provis & Sons, W., Tumby Bay .....	" .....	111	803
24	Dugan, T., Wingfield Rifle Range, Port Adelaide .....	" .....	109	781
25	Bansemmer, Mrs. B., Beaumont .....	" .....	129	1,011
Totals .....			2,809	18,486

## SECTION 4.—HEAVY BREEDS (PEN TEST). SIX PULLETS EACH ENTRY.

26	Lampert, Mrs. S., Piccadilly .....	Black Orpingtons .....	74	745
27	Farr, K. H., Fullarton Estate .....	" .....	100	789
28	Bansemmer, Mrs. B., Beaumont .....	" .....	—	—
29	Farr, K. H., Fullarton Estate .....	" .....	119	910
30	Lampert, Mrs. S., Piccadilly .....	" .....	—*	—*
31	Alford, T., Broken Hill .....	" .....	—*	—*
32	Clee Hill Stud Poultry Farm, Box Hill, Victoria .....	" .....	107	930
33	Lampert, Mrs. S., Piccadilly .....	" .....	105	1,046
34	Ryan, Jas., Coburg, Victoria .....	Rhode Island Reds ..	111	1,066
Totals .....			616	5,486

\* Failed under Regulation 12.

† One bird dead.

## DIVISION B.—STANDARD BREEDS ONLY.

19 Pens each of 6 Birds—114 Birds.

COMMENCING APRIL 1ST, 1921. TERMINATES FEBRUARY 28TH, 1922.

Pen No.	Name and Address.	Breed.	Eggs Laid for Month Ending 30/11/21	Total Eggs Laid from 1/4/21 to 30,11/21.
37	*Lampert, Mrs. S., Piccadilly .....	White Leghorns.....	—	—
38	*Newcombe, E. G., Alberton .....	" .....	—	—
39	Packham, C. D., Kensington Park...	" .....	122	653
40	*Beythien, E. W., Scott's Creek.....	" .....	—	—
42	Packham, C. D., Kensington Park...	" .....	109	628†
43	*Newcombe, E. G., Alberton .....	" .....	—	—
44	Belmont Orpington Yards, Evandale.	Black Orpington .....	117	801†
45	*Lampert, Mrs. S., Piccadilly .....	" .....	—	—
46	*Farr, K. H., Fullarton Estate.....	" .....	—	—
47	Bansemmer, Mrs. B., Beaumont .....	" .....	95	837
48	Addison, Mrs. A. L., Malvern .....	Rhode Island Red....	99	675†
49	*Beer, A. C., Gilberton .....	" .....	—	—
50	Hill, H. V., West Adelaide .....	" .....	64	597
51	*Beer, A. C., Gilberton .....	" .....	—	—
52	Perkins, C. W., North Norwood ....	Silver Wyandotte ....	101	722
53	Addison, A. L., Malvern .....	White Wyandotte ...	84	535
54	Bagshaw, W. E., Hermitage .....	White Rocks .....	78	595
55	Bagshaw, W. E., Hermitage .....	Barred Rocks.....	92	545
Totals .....			963	6,588

\* Not in accordance with standard.

† One bird dead.

## IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC.

During the month of October, 1921, 14,742bush. of bananas, 58 packages of cocoanuts, 31bush. of cucumbers, 132bush. of passion fruit, 6 packages of peanuts, 845bush. of pineapples, 18 packages of plants, 9,956 bags of potatoes, 78 packages of seeds, and 1,435 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts, 1885 to 1910. Of these, 23bush. of bananas (over-ripe) were destroyed, and 39 empty wine casks were fumigated.

Under the Federal Commerce Act 3,005 packages of citrus fruit, 5,114 packages of dried fruit, 925 packages of preserved fruit, 2,018 packages of jam, and 1 package of plants were exported to oversea markets. These were consigned as follows:—To London—3,184 packages of dried fruit, 900 packages of preserved, 2,018 packages of jam, and 1 package of plants. To New Zealand—690 packages of dried fruit, 3,005 packages of citrus fruit, and 25 packages of preserved fruit. To South Africa—1,230 packages of dried fruit. To Hong-kong—10 packages of dried fruit.

Under the Federal Quarantine Act, 1,629 packages of seeds, &c., were examined and admitted from oversea sources.

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of November, 1921, also the average precipitation to the end of November, and the average annual rainfall.

Station.	For Nov., 1921.	To end Nov., 1921.	A'v'ge. to end Nov.	A'v'ge. Annual Rainfall	Station.	For Nov., 1921.	To end Nov., 1921.	A'v'ge. to end Nov.	A'v'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.					LOWER NORTH—continued.				
Oodnadatta .....	—	7.82	8.97	4.73	Spalding .....	0.80	21.30	19.17	20.18
Marree .....	0.05	5.03	5.42	6.02	Guinane .....	1.11	20.03	18.19	18.97
Farina .....	0.21	5.99	6.06	6.57	Yacka .....	2.29	19.95	14.62	15.27
Copley .....	0.23	8.27	7.63	8.30	Koolunga .....	1.19	19.01	14.90	15.73
Beltana .....	0.34	9.13	8.20	8.93	Snowtown .....	1.49	21.26	15.35	15.87
Blinman .....	0.60	11.18	11.71	12.52	Brinkworth .....	1.43	17.91	15.48	15.91
Taroona .....	0.24	13.34	7.10	7.33	Blyth .....	1.77	22.86	15.91	16.55
Hookina .....	0.25	18.11	11.97	12.65	Clare .....	1.82	28.28	23.29	24.47
Hawker .....	0.44	20.63	11.68	12.37	Mintaro .....	2.07	25.02	22.15	23.07
Wilson .....	0.40	19.94	11.36	11.85	Watervale .....	2.03	27.60	22.91	27.48
Gordon .....	0.59	23.89	10.05	10.43	Auburn .....	2.11	26.94	23.11	17.82
Quorn .....	0.24	23.08	13.30	13.79	Hoyleton .....	1.53	20.26	16.92	15.82
Port Augusta .....	0.29	17.81	8.88	9.42	Balaklava .....	1.72	18.54	15.08	13.14
Port Augusta West .....	0.26	17.61	9.84	9.36	Port Wakefield .....	1.00	18.30	12.60	13.64
Brue .....	0.17	18.12	8.93	9.99	Terowie .....	0.86	17.74	12.64	13.97
Hammond .....	0.24	26.13	10.85	11.36	Yarowie .....	0.95	19.17	13.22	13.64
Wilmington .....	0.42	18.74	17.26	18.06	Hallett .....	0.95	19.50	15.37	16.28
Willowie .....	0.31	26.99	13.41	11.82	Mount Bryan .....	0.66	20.65	15.47	16.38
Melrose .....	0.88	22.88	22.25	23.11	Burra .....	1.16	22.51	17.09	17.91
Booleroo Centre .....	0.45	19.86	14.58	15.51	Farrell's Flat .....	1.23	21.58	17.98	18.87
Port Germein .....	0.25	21.18	11.90	12.65	WEST OF MURRAY RANGE.				
Wirrabara .....	0.63	21.35	18.63	19.44	Manoora .....	1.64	20.59	17.57	18.64
Appila .....	0.40	22.79	13.37	14.90	Saddleworth .....	1.60	20.97	18.74	19.75
Craddock .....	0.37	20.34	10.34	10.82	Marrabel .....	1.78	22.72	18.74	19.44
Carrieton .....	0.57	23.40	11.69	12.34	Riverton .....	1.78	21.20	20.79	20.74
Johnburg .....	0.52	18.50	9.77	10.22	Tarlee .....	2.36	19.42	16.79	17.86
Eurelia .....	0.24	21.63	12.58	13.11	Stockport .....	2.34	21.05	15.53	16.36
Orroroo .....	0.40	20.75	12.74	13.42	Hamley Bridge .....	2.12	18.82	15.59	16.52
Nackara .....	0.55	19.71	10.77	10.63	Kapunda .....	2.40	21.27	18.86	19.85
Black Rook .....	0.39	15.75	11.83	12.29	Freeling .....	2.22	18.71	16.96	17.95
Uolula .....	0.23	14.48	11.26	11.65	Greenock .....	2.28	21.31	20.54	21.73
Peterborough .....	0.18	15.89	12.51	13.82	Truro .....	1.86	24.09	19.16	20.18
Yongala .....	0.53	15.75	13.47	14.13	Stockwell .....	2.22	21.37	19.26	20.40
LOWER NORTH-EAST.					Nuriootpa .....	1.98	22.43	19.90	21.09
Yunta .....	0.54	14.80	8.10	8.50	Angaston .....	1.83	23.06	20.98	22.33
Waukaringa .....	0.77	12.75	7.70	8.14	Tanunda .....	2.19	22.96	21.19	22.54
Mannahill .....	0.19	16.54	7.82	8.51	Lyndoch .....	2.22	24.09	21.87	22.81
Cookburn .....	0.35	—	—	8.03	Williamstown .....	2.35	24.62	27.48	27.74
Broken Hill, N.S.W. .....	1.06	15.34	9.21	9.98	ADELAIDE PLAINS.				
LOWER NORTH.					Mallala .....	1.85	19.23	16.76	16.61
Port Pirie .....	0.65	19.99	13.31	13.26	Roseworthy .....	1.77	17.18	17.18	17.37
Port Broughton .....	0.79	17.69	13.55	14.13	Gawler .....	2.01	18.91	17.83	19.14
Bute .....	1.19	19.91	15.01	15.55	Two Wells .....	1.36	14.97	15.11	15.91
Laura .....	1.29	22.32	17.24	18.12	Virginia .....	1.63	16.09	16.50	17.11
Caltowie .....	0.85	21.74	16.10	17.02	Smithfield .....	2.26	16.70	16.34	17.33
Jamestown .....	0.72	21.58	16.69	17.58	Salisbury .....	1.90	16.40	17.76	18.53
Bundaleer W. Wks. .....	0.89	21.06	16.66	17.56	North Adelaide .....	2.60	26.23	20.85	21.87
Gladstone .....	1.12	20.28	15.25	16.05	Adelaide .....	2.20	22.14	20.05	21.01
Crystal Brook .....	1.20	22.40	14.86	15.82	Glenelg .....	2.25	18.04	17.56	18.42
Georgetown .....	1.02	21.17	17.38	18.30	Brighton .....	2.50	22.95	20.21	21.03
Narriby .....	0.81	16.31	15.55	16.43	Mitcham .....	2.67	25.79	22.93	23.68
Redhill .....	1.44	23.43	15.96	16.66	Glen Osmond .....	2.90	25.68	25.66	25.72
					Magill .....	2.43	22.64	24.41	25.38

## RAINFALL—continued.

Station.	For Nov., 1921.	To end Nov., 1921.	Av'ge. to end Nov.	Av'ge. Annual Rainfall	Station.	For Nov., 1921.	To end Nov., 1921.	Av'ge. to end Nov.	Av'ge. Annual Rainfall
<b>MOUNT LOFFY RANGES.</b>					<b>WEST OF SPENCER'S GULF—continued.</b>				
Teetree Gully.....	2-24	23-15	26-58	27-73	Tumby .....	2-15	18-49	13-82	14-76
Stirling West .....	4-26	43-04	44-86	46-82	Carrow .....	2-14	17-75	13-86	15-14
Uraidla .....	4-10	37-58	42-38	44-40	Arno Bay .....	1-34	18-23	12-49	13-10
Clarendon .....	3-26	32-90	31-74	33-18	Cleve .....	0-91	20-37	—	14-46
Morphett Vale .....	2-81	23-39	21-83	22-90	Cowell .....	1-46	12-31	11-00	11-56
Noarlunga .....	2-65	22-36	19-51	20-21	Point Lowly .....	0-32	21-96	11-32	11-84
Willunga .....	2-71	26-77	21-97	25-82	Kimba .....	1-99	—	—	—
Aldinga .....	2-26	21-72	19-45	20-22	Minippa .....	0-58	—	—	—
Myponga .....	3-12	28-61	—	—	<b>YORKE PENINSULA.</b>				
Normanville .....	2-75	28-49	19-77	20-53	Walleroo .....	0-88	19-52	13-53	14-11
Yankalilla .....	3-46	26-44	24-22	22-03	Kadina .....	1-02	21-05	15-34	15-93
Mount Pleasant .....	2-69	32-69	26-03	27-01	Moonta .....	1-75	20-14	14-65	15-93
Birdwood .....	3-58	30-13	27-16	29-43	Green's Plains .....	0-89	19-61	15-16	15-75
Gumeracha .....	3-81	34-43	31-98	33-33	Maitland .....	2-27	24-29	19-34	20-20
Millbrook Rsvr. .....	3-51	33-39	—	—	Ardrossan .....	1-76	20-62	13-42	13-96
Tweedvale .....	2-62	33-92	34-30	35-60	Port Victoria .....	1-96	19-78	14-75	15-34
Woodside .....	3-36	32-96	30-93	32-05	Curramulka .....	2-69	19-38	17-85	18-31
Ambleside .....	4-05	35-22	33-16	34-81	Minlaton .....	2-51	21-68	17-20	17-70
Nairne .....	3-18	26-97	27-38	28-58	Brentwood .....	2-49	21-48	17-78	15-44
Mount Barker .....	4-25	33-52	28-96	31-10	Stansbury .....	2-03	19-76	16-20	17-08
Echunga .....	4-15	33-81	31-75	32-94	Warooka .....	2-93	23-48	17-14	17-74
Macolesfield .....	4-11	29-61	29-44	30-60	Yorketown .....	2-29	19-25	16-66	17-29
Meadows .....	3-48	34-61	35-76	36-26	Edithburgh .....	2-46	18-50	15-94	16-58
Strathalbyn .....	3-02	22-04	18-47	19-28	<b>SOUTH AND SOUTH-EAST.</b>				
<b>MURRAY FLATS AND VALLEY.</b>					Cape Borda .....	1-23	27-61	24-14	24-96
Meningie .....	2-31	22-57	16-84	18-77	Kingscote .....	2-76	22-43	18-30	18-92
Milang .....	1-56	13-82	14-77	15-56	Penneshaw .....	2-23	21-91	18-45	21-39
Langhorne's Bdge. ....	2-21	17-70	13-85	14-59	Victor Harbor .....	3-09	22-09	20-60	21-56
Wellington .....	1-81	17-73	13-90	14-82	Port Elliot .....	2-72	22-44	19-22	20-00
Tailm Bend .....	2-47	19 13	12-20	24-55	Goolwa .....	2-31	20-41	17-19	17-87
Murray Bridge .....	2-22	17-72	13-07	13-98	Meribah .....	0-62	11-40	—	—
Callington .....	1-98	17-54	14-65	15-45	Mindarie .....	0-93	12-12	—	—
Mannum .....	1-93	16-74	10-96	11-51	Karoonda .....	1-93	20-70	—	—
Palmer .....	2-44	19-88	14-48	15-23	Pinnaroo .....	1-17	20-17	14-43	15-57
Sedan .....	1-18	18-10	11-52	12-07	Parilla .....	1-02	16-75	14-61	14-02
Swan Reach .....	1-08	18-02	10-09	10-80	Lameroo .....	1-37	17-98	14-29	16-45
Blanchetown .....	0-48	10-89	9-53	10-26	Parrakie .....	1-62	16-21	13-52	14-42
Eudunda .....	1-30	18-52	16-61	17-51	Geranium .....	1-97	18-41	15-17	16-24
Sutherland .....	1-48	16-19	11-23	10-90	Peake .....	2-11	18-86	15-07	16-25
Morgan .....	0-66	14-06	8-42	9-13	Cooke's Plains .....	2-21	19-61	14-10	15-00
Waikerie .....	0-68	12-95	8-86	9-41	Coomandook .....	1-81	21-40	16-57	17-75
Overland Corner .....	0-16	10-04	10-29	11-11	Coonalpyn .....	2-11	16-37	15-54	17-64
Loxton .....	0-58	11-95	11-63	12-27	Tintinara .....	2-95	18-15	17-48	18-83
Renmark .....	0-60	12-71	10-21	10-92	Keith .....	2-28	18-53	16-21	18-64
<b>WEST OF SPENCER'S GULF.</b>					Bordertown .....	2-93	18-65	18-38	19-52
Euda .....	0-63	7-51	10-51	10-03	Wolsley .....	2-94	19-17	17-17	18-07
White Well .....	0-51	—	8-57	9-24	Frances .....	2-67	18-41	18-54	20-10
Fowler's Bay .....	0-55	10-71	11-89	12-11	Naracoorte .....	2-68	23-88	21-24	22-53
Penong .....	1-12	16-37	11-89	12-26	Penola .....	2-76	21-66	25-01	26-48
Murat Bay .....	1-05	10-89	9-75	10-47	Lucindale .....	2-72	—	21-78	22-93
Smoky Bay .....	1-21	11-72	10-02	10-37	Kingston .....	3-04	—	20-59	24-61
Petina .....	1-00	13-63	12-59	12-97	Robe .....	2-39	—	23-60	24-60
Streaky Bay .....	1-18	14-26	14-72	15-09	Beachport .....	2-08	20-36	26-22	27-29
Talia .....	1-85	16-42	14-80	15-35	Millicent .....	3-17	28-05	28-22	29-29
Port Elliston .....	2-37	17-05	16-46	16-37	Kalangadoo .....	2-67	27-42	—	—
Cummins .....	1-85	18-88	—	—	Mount Gambier ..	2-59	22-92	29-25	31-65
Port Lincoln .....	2-42	17-29	19-10	19-83					

## AGRICULTURAL BUREAU REPORTS.

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Barmora .....	471	13	10	Gorrie .....	*	14	11
Beetaloo Valley .....	446	†	†	Green Patch .....	*	†	†
Belahie North .....	*	16	14	Gumeracha .....	*	12	16
Berri .....	†	14	11	Halidon .....	*	—	—
Big Swamp .....	*	—	—	Hartley .....	*	14	—
Blackheath .....	†	10	14	Hawker .....	*	13	17
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Blackwood .....	†	19	16	Hookina .....	†	16	12
Blyth .....	†	17	14	Inman Valley .....	*	—	—
Booleroo Centre .....	*	9	13	Ironbank .....	*	10	14
Borrika .....	*	—	—	Julia .....	*	—	—
Bowhill .....	*	—	—	Kadina .....	*	—	—
Brentwood .....	455-56	16	12	Kalangadoo .....	*	10	14
Brinkley .....	*	10	14	Kanmantoo .....	*	10	14
Bundaleer Springs ..	*	—	—	Keith .....	*	—	—
Burra .....	*	—	—	Ki Ki .....	*	—	—
Bute .....	*	13	10	Kilkerran .....	456	16	12
Butler .....	*	—	—	Kimba .....	*	—	—
Cadell .....	*	—	—	Kingscote .....	*	—	—
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Miltalie .....	463	†	†	Riverton (Women's) ..	*	—	—
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Monarto South .....	†	—	—	Saddleworth .....	†	—	—
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Moorook .....	†	—	—	Sandalwood .....	*	—	—
Morchard .....	442	10	14	Shoal Bay .....	478	—	—
Moruan .....	*	—	—	Smoky Bay .....	462-63	10	—
Morphett Vale .....	477	†	12	Spalding .....	*	—	—
Mount Barker .....	*	14	11	Stockport .....	*	—	—
Mount Bryan .....	449	—	—	Stathalbyn .....	*	13	17
Mount Byran East ..	446	†	†	Talia .....	463	12	9
Mount Compass .....	*	—	—	Tantanoola .....	†	10	14
Mount Gambier .....	479	10	14	Taplan .....	471	17	14
Mount Hope .....	†	10	14	Tarcowie .....	442	13	10
Mount Pleasant .....	*	—	—	Tatiara .....	479	17	21
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Mundalla .....	*	14	11	Uraidla & Summertown	*	5	9
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Murray Bridge .....	*	—	—	Virginia .....	*	†	—
Mypolonga .....	†	†	†	Waikerie .....	472	—	—
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Narrung .....	*	17	14	White-Yarowie .....	447	—	—
Neeta .....	*	—	—	Wilkawatt .....	472	†	†
Netherton .....	†	†	†	Williamstown .....	†	7	4
North Boorowie .....	449	†	†	(Women's)	*	—	—
North Bundaleer .....	*	—	—	Williamstown .....	452, 455	9	13
Northfield .....	*	—	—	Willowie .....	444	†	†
Nunkeri and Yurgo ..	*	4	1	Wilmington .....	444	14	11
O'Loughlin .....	†	14	11	Windsor .....	463	†	—
Orroroo .....	443, 445	—	—	Winkie .....	472	—	—
Owen .....	451	—	—	Wirrabara .....	449	17	—
Parilla .....	*	—	—	Wirrega .....	*	—	—
Parilla Well .....	472	†	2	Wolowa .....	*	—	—
Parrakie .....	472	—	—	Wudinna .....	†	—	—
Paruna .....	*	—	—	Wynarka .....	*	—	—
Paskeville .....	469	13	—	Yabmana .....	*	—	—
Penola .....	*	3	7	Yacka .....	†	—	10
Petina .....	†	31	28	Yadnarie .....	463	†	†
Pine Forest .....	*	—	—	Yallunda .....	*	—	—
Pinnaroo .....	†	†	†	Yamnee .....	*	—	—
Pomprota .....	*	—	—	Yelanna .....	462	†	†
Port Broughton .....	448	9	13	Yongala Vale .....	*	9	13
Port Elliot .....	*	17	21	Yorketown .....	*	—	—
Port Germein .....	*	17	14	Youghusband .....	472	15	12
Ramco .....	†	12	9				

\* No report received during the month of November. † Recess. ‡ Held over until next month.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

MORCHARD (Average annual rainfall, 13.50in.).

October 15th.—Present: 14 members and four visitors.

EXHIBIT NIGHT.—The report of the delegates to the Annual Congress was received and discussed. The remainder of the evening was devoted to an inspection and discussion of the following exhibits:—Mr. Kupke tabled excellent samples of figs that had been grown and dried on his farm. The same member also exhibited a number of sheep-skin mats that had been scoured and tanned at a cost ranging from 7s. 6d. to 11s. 6d. each. Mr. H. Toop was responsible for an interesting display of tools made from discarded parts of old machines and implements. Mr. F. Scriven tabled a fowl trough constructed with petrol tins. Mr. Lillierapp showed a device for tallying

ORROROO (Average annual rainfall, 13.42in.).

September 10th.—Present: seven members.

TREE PLANTING.—Mr. R. Read, who contributed a short paper on this subject said, on the majority of holdings in South Australia one could not help noticing the necessity for tree planting. There was no doubt that clumps of trees planted in the fields and around the homestead considerably enhanced the value of a property. In addition to that, the trees provided protection and shelter for the stock during the hot summers and the cold bleak winds of winter. For planting in that district the speaker suggested the following trees:—Native Red Gum, Sugar Gum, Native Pine, Pepper Tree, and Tree Lucerne.

TARCOWIE (Average annual rainfall, about 15½in.).

October 11th.—Present: 14 members.

WASTERS ON THE FARM.—“By the term waster, I mean some animal, implement, machine, &c., that is not returning the proper value to the farm for the money expended upon it,” said Mr. W. S. Ninnies in a paper on the above subject. Referring to the team, the speaker said if a horse was a poor “doer” or a lazy worker he should immediately be disposed of, for as a rule such an animal took just the same amount of fodder as one of the willing and well-conditioned horses. He considered it a mistake on the part of the farmer to dispose of his young horses when he was offered a good price for them. The work could not be performed in the same time with a team of old horses, and as a rule one had to provide better fodder for the older animals. If one paid close attention to the farm flock a number of sheep would possibly be discovered with loose wool and other defects in the fleece. Such animals should be culled and sold to the butcher. The dairy herd should be tested, and all cows not giving a good percentage of butter fat

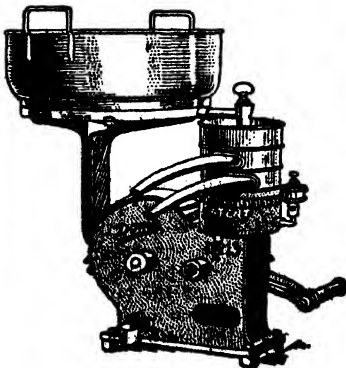
should be fattened and sent to market. If the farmer made a practice of disposing of all hens after their third laying season the poultry, he believed, would be placed on a payable footing. Again, old and out-of-date implements and machines were another source of waste. They not only wasted time, but they had to be frequently repaired. The speaker also referred to the importance of seeing that cream was not wasted on account of parts of the separator becoming worn. He also thought it was every farmer's duty to exert every effort to keep rabbits and noxious weeds in check. Mr. J. P. Smith, in discussing the paper, referred to the horses. He thought the best plan was to endeavor to secure a team in which each animal worked at the same pace. He agreed that the flocks of sheep and herds of cattle would be considerably improved if the farmer paid more attention to the culling of the wasters. He had recently secured a good bull, and he hoped that a marked improvement in his herd would result from the introduction of fresh and pure blood. Mr. W. L. Hortin was of the opinion that it would pay the farmer to secure a good ram for improving the standard of his sheep. Mr. W. H. Thomas was glad the speaker had referred to the use of old implements. There was no doubt that by using an old harvester a large amount of grain was wasted. The report of the delegates to the Annual Congress was also received and discussed.

#### WARCOWIE.

October 19th.—Present: six members.

**CARE OF FARM IMPLEMENTS.**—In the course of a short paper dealing with this subject Mr. A. Crossman was of the opinion that when farm implements became worn out in a short time, the trouble was due, in many cases, to neglect on the part of the farmer, and not through the fault of the manufacturer. Before the new machine was put into commission it should be thoroughly overhauled, special attention being given to the bearings to see that oil fed freely into them. Nuts and bolts should be tightened up, and in the event of one breaking it should be

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replaced with a bolt, and not a piece of wire. When the implement had finished work for the season, everything required in the way of repairs should be noted and repaired as soon as possible, so that delay in commencing the next year's work would be avoided. Before taking the machine into the paddock it was a good plan to pour kerosine into all the bearings, as that would remove most of the dirt and thick grease from the feed holes. The erection of a good weather-proof shed, and a coat of paint given to the woodwork every few years would do much towards lengthening the life of all farm implements.

#### WILMINGTON (Average annual rainfall, 18.26in.).

October 25th.—Present: 10 members and two visitors.

**QUESTION BOX.**—The meeting took the form of a "Question Box," when several interesting subjects were brought forward for discussion. The following remedy was given for vermin on pigs:—Mix a small quantity of kerosine into thick machinery oil, and apply to the animals, or use tobacco water on the pigs and ashes in sties. A discussion arose as to the legality of selling milk and cream from cancerous cows and the disposal of the beast. Members agreed that such practice should not be permitted. A complaint was made by a member that his farm stables, yards, and outhouses were infested with fleas. Mr. Duhring suggested the use of carbolic fluid to disinfect, and mixing poison in water, and sprinkling where necessary. To an inquiry as to the use of ensilage, members replied that the cost of labor generally prohibited farmers and dairymen from conserving fodder extensively in that form. Silos were expensive, although members agreed that ensilage was particularly good feed.

#### WILLOWIE (Average annual rainfall, 11.90in.).

September 8th.—Present: eight members and visitors.

**CARE OF HORSES' SHOULDERS.**—"The care of horses' shoulders is one of the most important questions of the farm," said Mr. A. E. Tozer, in a paper under the above heading. Continuing, the speaker said a horse with a sore shoulder very often lost condition. If any machine or implement was out of order it was overhauled and put right, but if a horse had a sore shoulder too frequently no notice was taken of it. The animal was harnessed and worked from morning till night, and in some instances nothing was put on the shoulder, which gradually became worse. He had visited many farms, and nearly every farm had different methods of treating the horses' shoulders. In all his experience with horses he had found that one could not be too careful in harnessing up. The shoulders should be brushed before harnessing in the mornings, and also at dinner time. Before commencing work, the collars and hames should be buckled up as tightly as possible, the false collars eased, and the manes pulled out from under the harness. Collars should be hammered out occasionally, because they sometimes got out of shape. He had found Condyl's crystals dissolved in water an excellent remedy for sores. It was economical, healing, and cleansing, and cut any proud flesh which might have formed. A good preventive of sores was to dissolve 1lb. of salt in a gallon of water, and wash the shoulders with the liquid. That seemed to harden the skin, and if the shoulders of young horses that were being broken in were washed with it it would prove a great help. The best false collar to use was one made with a piece of sheep's skin about 9in. wide. A skin with careful cutting would make two collars. The skin should be cut from the tail to the neck, all ragged pieces removed, and the wool placed next to the collar. The best way to attach the sheep skin was to sew it to the lining of the collar, but care should be taken that no crinkles or folds were allowed to form on the collars.

**FALLOWING.**—In the course of a paper dealing with this subject, Mr. F. M. Starkey said fallowing should be commenced about the end of June or the beginning of July. The land should be ploughed from 3in. to 4in. deep, and harrowed to check the weeds from taking root. He preferred warm, sunny days for harrowing, so that all the weeds turned over would be destroyed. Harrowing also compacted the soil, which enabled the seeds to germinate more readily. Sheep were a great help in cultivating operations. They checked the growth of the weeds, and made a fine tilth on the surface soil. If the weeds were at all thick

it was a good plan to work a light harrow behind the cultivator. By leaving the sowing until after the autumn rains, the weeds would start soon after the advent of summer. If the fallow was kept in good order it could be put under crop more easily and in less time than land that had not received such thorough treatment.

AMYTON, October 24th.—An interesting discussion took place on the subject, "Diseases of Wheat Crops and their Treatment." A full report of the Annual Congress was given by Messrs. T. Ward and H. K. Gum. Other subjects of local interest were also brought forward and discussed.

ORROROO, October 29th.—An enjoyable and instructive homestead meeting was held at Mr. A. L. Brice's residence. During the afternoon members inspected the garden and farm, under the guidance of Mr. Brice, and in the evening the usual formal business of the Branch was transacted, after which several musical selections were rendered. A hearty vote of thanks was accorded Mrs. Brice for her hospitality in providing tea for the visitors.

## MIDDLE-NORTH DISTRICT.

### (PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 23.50in.).

October 20th.—Present: eight members and three visitors.

POULTRY BREEDING.—The following paper was read by the Hon. Secretary (Mr. J. Burton):—I consider the best utility breeds of poultry for this district are Rhode Island Reds, Barred Rocks, and Black Orpingtons. They are all good winter layers, with fairly large frames, make good table birds, and are good setters. For egg production the Leghorns are certainly the best, but unless housed during winter months they are not so good as the other breeds mentioned, and having small frames are not to be recommended for table use. For breeding purposes, do not be content with buying a bird that is simply of the breed you desire, but get a cockerel and six hens of a standard type and color and of a known laying strain. With care and attention you should be able to raise 100 chicks the first year, which will give you a good start, and enable you to breed from your own stock. For laying purposes I prefer to keep fowls in confinement. If this is done it will be noticed that during the cold weather the egg supply from these birds will not fall off to the same extent as those hens that are allowed to run at large. The maintenance of fowls that are kept in confinement can only be gained by practical experience. Fowls that have free range find their own living to a great extent, but this varies during the year, for at times natural food is more plentiful than at others. Those running at large reduce the feeding cost. It would be a difficult matter to give the exact proportion and manner in which poultry should be fed. Birds are kept in such a variety of conditions and circumstances that it is not possible to give directions to suit all. We will now consider the subject from the farmer's standpoint. Poultry keeping pays if carried on with common sense and attention. The successful farmer is not content to grow only wheat and wool, but makes his side lines add to the general revenue, and of these, none will give a better return for the labor bestowed upon them than poultry. The farmer need not go in for any fancy breed, unless as a hobby, but he should raise a breed that will return plenty of eggs and be useful for the table. If you do not provide proper housing accommodation for chicks, it is better, during the earlier part of the season, to allow the hens do the hatching, for a good deal of time is required in looking after the chicks during the cold wet months. I prefer the incubator as it takes less time and labor than the broody hen. Again, incubator chicks are less bother than a number of hens with chicks. The birds raised by artificial means are more easily handled, and are very quiet, even when full grown. I think it would pay to raise about 200 chicks annually, chiefly because the larger proportion is nearly always cockerels, and it is imperative to have young birds for egg production. Separate the cockerels from the pullets as soon as you can, and force them along and get them ready for market. Keep culling

the hens out, and you will probably have some birds to sell for breeding purposes. All drinking vessels should be kept clean, and fresh water supplied twice a day in warm weather. The houses should be cleaned out regularly, and fresh scratching material placed on the floor, perches cleaned and painted with kerosine or residual oil, and nests cleaned and sprayed out to keep vermin down. Do not keep any hens over two years old, unless for breeding purposes. Cockerels should not be allowed to run loose, as they worry the hens, and never put on condition. In a locality such as ours, the climate makes it necessary that fowls be provided with water-tight houses, opening to the east if possible, and the floor raised several inches above ground level. It is false economy to let fowls roost in trees or on machinery. Profit begins with the chicks. They should be hatched at such a time as to commence laying in March and April, for this will bring the greatest financial return. A small incubator and a brooder in judicious hands will soon pay for themselves. Gather the eggs daily, and send them away regularly. It was decided that the Branch should go into recess until February, 1922.

#### MINTARO.

August 20th.—Present: 16 members.

IS THERE A BETTER METHOD OF WORKING OUR LAND THAN THE BARE FALLOW SYSTEM?—"I believe that with an average rainfall of over 20in. in this and the Willilla districts we can do better than take off one crop from our land in two years," said Mr. E. Blatchford in a paper under the above title. The speaker was of the opinion that the farmers in the Mintaro district did not work their land to the best advantage. Again, a continual system of bare fallowing undoubtedly depleted the land of a large amount of humus. He did not dispute the contention that bare fallow would give better results than stubble land, but that was almost solely due to the extra working that the fallow land received. He was convinced that in such districts where a good rainfall could be relied upon it would be more profitable to utilise the fallow for fodder crops during the summer and early autumn, when the paddocks were usually short of feed. There was no doubt that on the majority of farms the paddocks were too large. They should be made smaller, and water, if possible, laid on to every one. With a system of subdivision it would not be necessary to plant all at the same time, and that would provide a continuity of fodder. He had ploughed stubble land in February, sown rape in March, and had exceptionally good feed right on until October. With such a practice the ewes and lambs were easily fattened and placed on the early markets. When the rape had been fed off he ran the cultivator over the land, and was able to reap a good crop of wheat the following year. The usual practice was to commence fallowing so soon as seeding was completed, but a good area of that land could be sown with peas and kale. One of his neighbors had sown a 16-acre paddock with barley, and fed off the crop. He then ploughed it after the first rains, harrowed it, and allowed it to lie out until after seeding. He then cultivated the land in August after a good rain, and drilled in peas at the rate of 1bush. to the acre with 100lbs. of super. The land was finally harrowed. Being an experiment, the crop was not put in very thickly, but in January four bags of peas were taken off. Eight cows and 150 ewes were turned on to the paddock, and after two weeks the cows were taken off. The ewes were left until March, and were in prime condition, and the crop that was taken off the following year was one of the best that had ever been grown on the property.

#### MOUNT BRYAN EAST (Average annual rainfall, 16in.).

October 15th.—Present: six members.

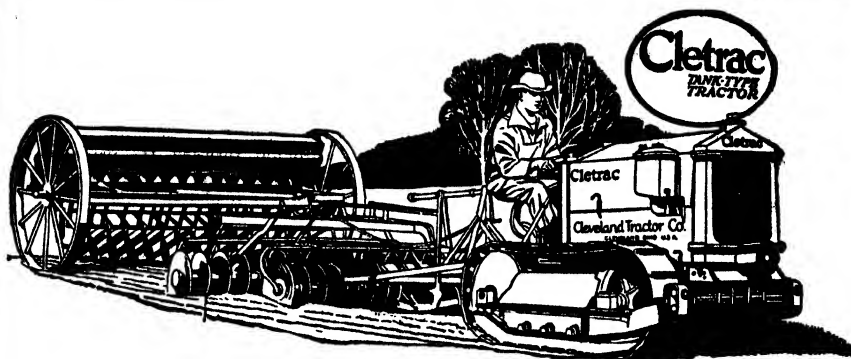
HAY MAKING.—In the course of a short paper dealing with this subject, Mr. V. Hughes said the first work in connection with the hay harvest was to see that the binder was in proper working order. The speaker was of the opinion that the crop, if cut about one week after the wheat had reached the flowering stage, would be more palatable to the stock than if cut while still green. Oats intended for hay should be cut just when the straw was beginning to show signs of a purple color. Stooking should be performed immediately after the binder had dealt with

the crop. Those sheaves that had first been cut should be used for the commencement of the stack. He contended that if the stack was kept too high in the middle there was a danger of the sheaves falling out, and thought it was best to build the stack with round corners and lay the sheaves heads outwards when forming the roof.

WHYTE-YARCOWIE (Average annual rainfall 13.91in.)

October 22nd.—Present: 11 members.

FENCING.—In the course of a paper under the heading "The Most Satisfactory Farm Fence" the Hon. Secretary (Mr. E. J. Pearce) first dealt with the boundary fence for which he preferred two gum posts, 8in. at the smaller end, 5ft. 2in. in length, placed in holes 20in. deep, to the chain; six No. 8 gauge black or galvanized wires should be used. If the fence was for sheep he would space the wires as follows:—First, 7in. from the ground; second, 13in.; third, 19in.; fourth, 25in.; fifth, 32in.; and the sixth, 40in. A mistake was often made of placing the bottom wire too close to the ground, for in many instances the land after a few years drifted and covered up the lowest wire. Between the heavy posts he would place three droppers. Jarrah, crimped wire, stamped steel, or chain lock droppers could be used. The last mentioned, while being somewhat more expensive than the other droppers, were to be preferred. In the first place they were practically indestructible, being made with No. 8 galvanized wire, they required no fastenings, they were easily attached after the wires had been strained, and they did not interfere with the straining of the wires after they had been attached. At intervals of from 12 chains to 16 chains, solid gum posts, not less than 12in. in diameter at the smaller end, should be placed 3ft. in the ground, but should it be desirable to make one stretch of wire more than 6 chains to 8 chains in



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length, he would fasten or strain the wire to one of the ordinary posts between the strainers. The estimated cost for material only for such a fence would be approximately £50 per mile, made up as follows:—150 gum posts at £8 per 100, £12; 15cwt. of black No. 8 wire at 26s. per cwt., £19 10s.; 7 strainers at 4s., £1 8s.; 2cwt. barb wire at 40s., £4; 450 droppers at 55s. per 100, £12 7s. 6d.; total, £49 5s. 6d. A cheaper fence than the one outlined above could be used for subdivision purposes. One heavy post and four droppers to the chain with five wires would reduce the cost per mile of fence by £15. If the fence was to be a permanent one he questioned the advisability of making a saving at the cost of efficiency. The size of the modern farm implements and machinery made it imperative that wide openings and gates should be made in the fences. For those that used a barb wire panel he suggested attaching a strong light piece of mallee to the end of the wire, and also two or three droppers, according to the width of the opening, at different intervals along the wire. The end droppers could be looped to the panel posts with wire or hoop iron. A short piece of mallee with a piece of chain to attach it to the posts could be used to fasten and tighten the panel. For the openings that were frequently used, gates were a necessity. The tubular iron gates could be purchased at a moderate figure, and they were very durable. It was, however, necessary to have a good fastening. The ordinary latch supplied with the gate was liable to yield to the pressure of stock rubbing themselves against the iron. He did not know of a more effective or economical fastening than a short piece of chain with a hook fastened with a strong staple to the gate post. In opening the discussion, Mr. McGregor did not think split gum posts as advocated by the writer of the paper could be purchased at the present time for £8 per 100. The speaker expressed a preference for heavy droppers and strains 20 chains in length. Mr. Walsh said if mallee or pine were used for the posts it was a good plan to remove the bark before placing them into the holes. He favored the iron standard droppers. Mr. McCallum had used both the iron and wooden droppers, and the latter, in his opinion, were to be preferred. The Chairman (Mr. P. McEntee) spoke of the good results that could be obtained by charring or tarring the ends of the posts. A reference was also made to the form of fence adopted by the Railways Department, but it was thought the posts had a tendency to break off at the junction with the cast-iron blocks.

**GLADSTONE, October 15th.**—The meeting took the form of a "Question Box," when several subjects of agricultural interest were brought forward, the principal items being "The Cure of Wounds and Sores on Horses" and "The Blowfly Pest." An interesting report of the Annual Congress was tendered by Mr. J. H. Sargent.

**LAURA.**—Mr. P. T. Bowker notified members that he had been in communication with the Field Engineer of the Department of Agricultural (Mr. J. Paull) re the construction of farm buildings, and intimated that that officer would be pleased to advise any member of the Bureau on matters relating to the erection of cowsheds, pigsties, stables, and other farm structures. An interesting discussion also took place on the subject, "Destruction of Noxious Weeds."

**LAURA, October 14th.**—Nine members were present at the October meeting to hear and discuss the report of the delegates who represented the Branch at the Annual Congress.

**PORT BRIGHTON, October 21st.**—Messrs. Vanstone and Lewis reported on the proceedings of the Annual Congress. A discussion took place on the subject, "Compulsory Registration of Sires," when it was agreed that the introduction of such a scheme would give more encouragement to owners of pure-bred stock to travel their animals. Members reported that mice were doing considerable damage to the green crops. It was stated that the mice were eating off the green plants as soon as they came into head. Quite a number of farmers were erecting mouse-proof enclosures in which to stack the hay.

**MINTABO, October 20th.**—Mr. D. F. Laurie (Government Poultry Expert) attended the meeting and delivered an address, "Poultry Keeping on the Farm."



**MOUNT BRYAN, October 15th.**—An interesting evening was spent in reading and discussing the paper, "The Pig Industry, a Neglected Source of National Wealth," read by the Director of Agriculture (Professor Arthur J. Perkins) at the Annual Congress.

**NORTH BOOBOROWIE, October 19th.**—Present: 10 members. Mr. C. Mayfield read the paper "How to make Country Life more Attractive" that had been contributed at the Annual Congress by Mr. H. Davies. In the discussion that followed, Mr. C. Mayfield considered that the inauguration of field trials and competitions for the best kept farms an excellent plan for keeping the young men in the country. Mr. A. V. Simpson was of the opinion that the drift of the young folks to the city was due in no small measure to the lack of modern comforts in many country towns and homes. Mr. F. Clark thought insufficient provision was made for the social entertainment of the young people.

**WIRABARA, October 8th.**—A report of the proceedings of the Annual Congress was given by Mr. P. J. Curnow, and an interesting discussion followed.

## LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT)

**BALAKLAVA** (Average annual rainfall, 16.03in.).

October 5th.—Present: 50, including members and visitors.

The Director of Agriculture (Professor Arthur J. Perkins) attended the meeting and delivered an address, "The Most Profitable Method of Growing, Harvesting, and Marketing of Grain and Other Farm Produce, with Special Reference to the Pig-raising Industry." The Secretary of the Advisory Board (Mr. H. J. Finnis) was also present, and delivered an address on matters concerning the work of the Agricultural Bureau.

**AUTOMATIC METHOD OF ERADICATING ANIMAL TUBERCULOSIS.**—Mr. D. McArthur read a paper under the above title. The speaker was of the opinion that a general compulsory tuberculin testing system was the only method for completely eradicating animal tuberculosis. It had to be admitted that tuberculosis existed in some of the swine and dairy herds of the State, and it was the first duty of every stock owner to report to the authorities any animals showing suspicious symptoms of the disease. The speaker paid a tribute to the Stock and Brands Department, for he considered that the clean bill of health of the majority of herds of the State was in no small way due to the vigilance of the officers of that department. Interesting statistics relating to the loss of livestock in the U.S.A., through the ravages of the disease, were quoted by the speaker.

## BLACK SPRINGS.

October 11th.—Present: 19 members.

**POULTRY ON THE FARM.**—In the course of a paper on this subject, Mr. J. Heinrich said egg production was a side line which was deserving of more attention on every farm. A flock of 150 White Leghorn hens with proper care and management should bring in at the end of the year from £50 to £70. In order to secure the best returns from the birds no hen should be kept after the third year. For determining the age of the pullets, the first year's birds should be marked on the outside of the left leg, second year on the outside of the same leg. The following year the other leg could be marked. A leather punch could be used for the purpose. The cockerels should be separated from the hens as soon as possible. The poultry run should have at least two breeding pens, and after the breeding season was over they could be used for the pullets and cockerels. The speaker made a strong point of the necessity for marketing only infertile eggs. He believed that if that plan was universally adopted, farm eggs would command a much better price in the markets than they did at the present time. For the ordinary farm the speaker thought the broody hen should be used to hatch the chicks, and for that reason it would be advisable to keep a few hens of one of the heavy breeds,

because the White Leghorns were known to be non-sitters. Cleanliness was important, and the pens and houses should be regularly cleaned out and a keen lookout kept for lice and tick.

**HORSE BREEDING.**—Mr. A. Mickel, who contributed a short paper dealing with this subject, said the first point to be borne in mind in the breeding of horses was to see that the mares were mated with the best sire available. More consideration should be given to the mare in foal than one observed on many farms, for if she was not in good condition she could not be expected to raise a strong and healthy foal. After foaling the mare should be kept in a warm place for a few days. At six months old the foal should be taken right away from its mother, and weaned. A good discussion followed the reading of both papers.

#### LONE PINE.

October 18th.—Present: 17 members.

**BOOK-KEEPING AND BANKING.**—The following paper was read by Mr. H. C. Hoile:—It is essential that every farmer and grower keep a record of all moneys received and all payments made in connection with the working of the property. Failing that it is necessary to have a banking account through which all these items are passed; the records are then kept for the farmer by the bank, but in the latter case it should be remembered that all transactions must go through the bank; but even if this is done it is also advisable to keep a private record. Do not commence by opening up an elaborate system of perhaps three or more books, because very few farmers would keep them properly written up. One or two books for receipts and payments, so long as they show clearly the amount of income earned and profit made, will be quite sufficient for the average farmer, and will simplify the compilation of the income returns. The banking account, besides being a safe place for holding money, deeds, scrip, and other papers, and valuables, enables cheques to be drawn, which greatly facilitates the transfer and payment of money. Payment by cheque is much more safe and convenient than handling large sums of money, the endorsement of a cheque being in itself a receipt. When sending cheques through the post always have them crossed. That is done by drawing two parallel lines right across the face of the cheque, so that it cannot be cashed over the counter of the bank on which it is drawn, but must go through an account. Do not cross cheques paid for wages, as they are usually drawn to be cashed. Do not make cheques payable to Mrs. or Mr., the initials are quite sufficient, otherwise they often cause trouble when drawn to "order." Endorse all cheques if drawn to "order" exactly as they are made payable on the face.

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## OWEN.

October 21st.—Present: 19 members.

**HAY AND HAYMAKING.**—A paper under the heading "Haymaking and Varieties to Grow for Hay" was contributed by Mr. W. J. Marshman. The speaker was of the opinion that where conditions were favorable, both spring and winter varieties of wheat should be sown. Of the late varieties Leak's Rust Proof was one that matured about the same time as Marshall's No. 3, and as a hay wheat it was known to be much superior to either the latter or Yandilla King. It made a good, dense growth, had an abundance of flag, was not too coarse in the straw, was very free from disease, and attained an excellent color when at the right stage for cutting. In addition to those points it weighed well over the bridge. Of the crops that he had grown, Leak's Rust Poof had proved very hardy so far as weather conditions were concerned. Late Crossbred 53 was another late variety. It required a good deal of rain to bring it to maturity, and was, he thought, better suited to districts with a heavier rainfall than Owen. However, under normal conditions it would produce a good cut of excellent hay, it stooled well, grew to a fair height, had a splendid color, and was very sweet in the straw. Warden was another late variety that made excellent hay. It stooled well, and in good season reached a greater height than most late wheats. It was able to withstand rough weather, and had a very fine straw that was relished by the stock. The early varieties were more popular than the later types, chiefly because of their ability to produce fair crops of hay under dry conditions. They were also capable of producing from 5cwt. to 10cwt. more in weight to the acre, and thirdly, because they brought a better price in the market. In his opinion, the bearded variety King's Red was without a rival for hay. It gave very heavy yields of a very palatable hay. It would be even more extensively grown, he believed, if it were not bearded. He was convinced that no sound reason could be found for the objections to growing it for hay. He had fed the bearded King's varieties in the sheaf and chaffed, to both old and young horses, for months at a time, and had never yet discovered any reasonable objection to it. To those who were prejudiced to the bearded wheats he suggested the following varieties:—Rajah, Sultan, Felix, President, and Emperor. He had had Rajah under trial for two seasons, and up to the present he was satisfied that it was going to prove a fine hay-producing wheat. The speaker then referred to the value of oats as a hay crop. Barley hay was not regarded with favor by farmers, yet it was of very high feeding value when cut at the right stage. Stooking, Carting, and Stacking.—When the hay contained a small amount of grain, such as would be the case when good marketable hay had obtained its maximum weight, stooking should be carried out as close up to the binder as possible. On no account should the sheaves be left lying in the paddock in rows, unstooked, for any length of time after rain. If caught in the rain the sheaves should be made into medium-sized upright stooks. The speaker was of the opinion that good palatable hay, during moderate weather, could not be carted into the stack until it had been allowed to cure for at least 18 days in the paddock. When forming the stack, the speaker believed the best plan to be to stack with the butts outwards all the time. If that was done the sheaves would not be so likely to slip. If the sheaves were placed heads outwards, and the stacking done in hot weather, a certain amount of damage to the hay could not be prevented, because one had constantly to be treading on the heads of the sheaves. The centre of the stack should be kept well filled, and considerably higher than the outside edges. If a large stack was to be erected, it was a good plan to build it in two sections, especially if the weather was at all unsettled. By building in sections, one was able to erect a false top, or raise the centre sufficiently high to turn the water off in a very short time. The straw of Early Gluyas and King's Early, being of a very solid nature, made excellent material for thatching or covering the stacks. In the discussion that followed it was generally agreed that by placing the sheaves butts outwards when building the stack the waste of grain was reduced to a minimum, and there was not so much danger of the stack slipping. In replying to a question from Mr. Bowyer as to the suitability of White Tuscan as a wheat for hay, Mr. Marshman stated that in normal years it was a good hay wheat, but it was very susceptible to rust. Mr. V. H. Scott did not think it wise to encourage the growing of flaggy hay

wheats, because when the hay was damped for cutting it gave the chaff a discolored appearance. He also thought it advantageous to mix oats with wheat when the crop was intended for hay. The Chairman (Mr. W. J. Marshman) exhibited samples of oats and wheats, keen interest being taken in a sample of Early Burt oats. The different varieties were very freely discussed, and members thought there was room for much improvement among the varieties of oats and wheat at present grown for hay.

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**WATERVALE** (Average annual rainfall, 27.17in.).

October 24th.—Present: 10 members and visitors.

**AFFORESTATION.**—Members, in discussing this question, were of the opinion that on small holdings, where the land was used for gardening, it was not a wise policy to plant forest trees, because they provided a harbor for bird pests, and also on account of the amount of moisture the trees took from the soil. The subjects of black spot and downy mildew were also brought forward for discussion, when it was unanimously agreed that every owner of vines should take all possible precautions, such as spraying and swabbing, to minimise the danger of an outbreak of the diseases. The report of the delegates to the Annual Congress concluded the meeting.

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**WILLIAMSTOWN.**

October 14th.—Present: 31 members and visitors.

**THE DAIRYING INDUSTRY.**—In a paper dealing with this subject, Mr. J. J. Bain said dairying was one of the most important industries of the State. To be successful the dairyman should treat the animals at all times with patience and kindness. Regular hours of milking and feeding were also points that should always be borne in mind. Different men expressed a preference for different breeds of cattle, but what ever type of cow was selected the important factor was that of keeping the breed pure, by breeding with pure-bred sires from cows that had attained a high standard of quality and quantity in milk production. In choosing a breed of cows, the farmer or dairyman should give serious consideration to the climatic conditions, for there was no doubt that the weather played an important part in the yields of the different breeds of cattle, for it was usually admitted that the Jersey was not able to endure the cold and wet weather so well as the Shorthorn or Ayrshire breeds. On a small holding, and where cows were the main source of revenue, strict attention to the culling of those animals that did not come up to standard was necessary. The next point to be considered was that of feeding. In certain parts of their district it was not necessary to hand feed during the whole of the year, but when the natural herbage showed signs of thinning out no time should be lost in resorting to supplementary feeding. He was of the opinion that lucerne was the best feed for the cows during the summer months, while maize, sorghum, and Sudan grass were also worth their place on the farm. For late autumn and the winter months he expressed a preference for berseem and barley. When the weather was exceptionally wet and stormy, good grass or wheaten hay helped to warm the animals and stimulate the milk flow. A good, clean supply of fresh water, easy of access, was also essential. Provision of shelter was of vital importance. If natural timber was not growing on the property, he suggested the erection of straw thatched sheds. They would be found warm in winter and cool in summer. The provision of salt licks would prove a valuable help in keeping the animals in good health. The pig industry was closely allied to that of dairying, and the by-products of the cows could be profitably utilised by feeding them to pigs.

**HANDLING DAIRY PRODUCE.**—In the course of a short paper dealing with this subject, Mr. L. S. Hammatt said the milk should be separated immediately after being taken from the cow, for it was then at about the right temperature. After separating, a small quantity of warm water should be run through the machine, but it should not be allowed to run into the vessel containing the cream. The cream should be stirred night and morning, and he considered it a mistake to mix warm and cold cream. When washing the dairy utensils, they should first be immersed in cold water, and then rinsed out with boiling water. After washing all parts of the separator should be exposed to the air. During the summer months

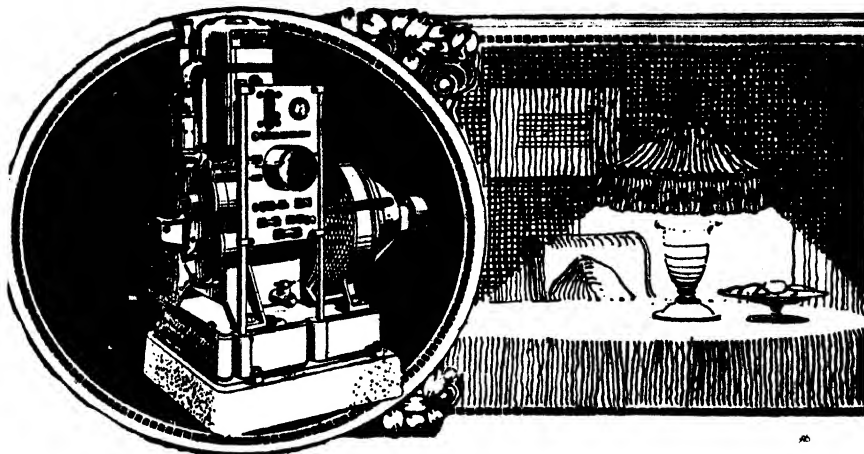
the cream should be kept in a cool place, and sent at least two or three times a week to the factory. The report of the delegates to the Annual Congress was then received.

#### WINDSOR.

October 11th.—Present: 18 members and seven visitors.

**CULTIVATION OF LUCERNE FOR COWS AND POULTRY.**—In the course of a short paper dealing with this subject, Mr. G. Price said while their district could not claim to be one especially adapted for dairying, a good deal of the difficulty could be overcome by the cultivation of lucerne. For a small plot he suggested that a block of land, 30yds. long by 8yds. wide, should be laid out on a level piece of ground. After the land had been ploughed to a depth of at least 6in. it should be worked down to a fine tilth and a load or two of sand distributed over the surface. In order to make the plot level, he suggested that a piece of timber should be dragged over the surface. The next proceeding was to throw out a furrow on all sides of the plot. After the seed had been sown it should be worked in lightly, the plot flooded, and finally divided into three equal parts with 3in. by 1in. jarrah. When the first section had been cut it should be flooded with water the remaining two plots could be similarly treated in turn. By the time the last section was cut the first should be again ready for a second cut. In the discussion that followed, one member thought the difficulty in growing lucerne in their district for cows and poultry rested upon the fact that farmers had to rely solely upon the Barossa main for water supplies. The speakers contended that the conservation of fodder in the form of ensilage would be a better proposition than growing crops for cutting. Another member expressed the opinion that fodder crops would prove more successful than lucerne, because the latter crop became overrun with prairie grass after it had been planted for a year or two. In replying to the criticism on the paper, Mr. Price was of the opinion that if the farmers were to clean out the dams that had been neglected since the water mains had been laid on, there would be no difficulty as regards the water supplies.

**HAY MAKING.**—In the course of an address on this subject, Mr. H. White said the correct condition of a crop for hay purposes should be determined on the manner in which it was intended to be used. If it was to be fed to stock in the form of hay, it should be cut so soon as the blooms had set; if in the form of chaff, not until the heads had filled out. Wilting was considered essential because it eliminated all possibility of the hay heating in the stack, and assisted to a very great extent in preserving its natural color. If the sheaves had to remain out in the paddock for a long period, the flat or round stook was to be preferred to the oblong one. Stacking, he asserted, should not be commenced until the hay had been in the stook for at least a fortnight. He considered it essential that the stack should be built upon a foundation of either straw, stones, or logs in order to prevent the damp from the ground from getting into the bottom layers of sheaves and spoiling them. It was immaterial in stacking whether the sheaves were placed butts outwards or heads outwards, but the following points should be observed—the sides left straight, the ends tilted upwards, the middle roof well peaked and free from hollows, and the eaves extending out from the sides for about 4in. to 6in. In conclusion, the speaker thought farmers should endeavor to build up a reserve of hay to carry the stock through periods of drought. In the discussion that ensued, it was agreed that the round stooks were better than either the oblong or flat ones, even though the latter class had the advantage of making the sheaves a good shape for stacking. It was further agreed:—(1) That King's Red and Gluyas were the best varieties of wheat for hay purposes in that district. (2) That Cape oats made the best hay obtainable for horses, but that seed was difficult to obtain, because that variety of oat was seldom left for reaping on account of its tendency to shake the grain in windy weather. (3) That if the hay became damp in the stack, salt should be thrown over it as a preservative. (4) That the method of stacking with the butts outwards was best, as it combatted the ravages of mice. (5) That mouse-proof fences around stacks had proved successful in dealing with the mouse trouble.



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**CLARE**, October 14th.—An interesting discussion took place concerning the compulsory spraying of orchards and vineyards, and Mr. C. T. Jarman gave a report of the proceedings of the Annual Congress.

**LYNDOCH**, October 13th.—An interesting discussion took place on the subject "Compulsory Spraying." Messrs. G. Brown and E. D. Powell, of the Williams-town Branch, attended the meeting and contributed papers, "Fruit Growing" and "Tomato and Potato Culture."

**LYNDOCH**, November 10th.—Mr. S. G. Bishop gave an interesting address, "Fencing." Several matters of local importance were also brought forward for discussion.

**ROSEDALE**, October 12th.—A homestead meeting was held at the residence of Mr. G. C. Hienjus, and an interesting afternoon was spent in inspecting the stock, implements, and crop.

**WILLIAMSTOWN**, November 11th.—The meeting took the form of a "Question Box," when a number of horticultural and viticultural subjects were brought forward for discussion.

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## YORKE PENINSULA DISTRICT.

(TO BUTE.)

### BRENTWOOD.

September 22nd.—Present: 15 members and five visitors.

**HOW TO MAKE FARM LIFE ATTRACTIVE.**—Every farmer who wishes to help stem the drift of the young people to the city should have for his motto, "Encourage the boys and girls to take an interest in the work of the farm," said Mr. F. L. Carmichael, in a paper dealing with the above subject. The writer of the paper thought it would be an excellent plan to give the boy when he left school a mare or a filly. If that was done on each farm a healthy rivalry would be stimulated between the youths, for each lad would strive to keep his horse in the best condition and endeavor to secure good foals. Should the boy express a preference for pigs, cattle, or poultry an effort should be made to meet his wish in a like manner. The girls could also be taken into confidence, and given a heifer calf or a pen of poultry to attend to. As the boys grew older they could be given a practical interest in the crop. The speaker spoke in very eulogistic terms of the Short Course for Farmers at Roseworthy Agricultural College that had been instituted by the Government, and considered it a valuable means of educating the primary producers. A set of books dealing with the various phases of agriculture would also be an acquisition to the farm. During the local show he thought it would be a good plan if the farmer was to take his boys around the different stock exhibits and explain to them the various good points and defects of the animals. Again the appearance of the homestead and farm buildings should not be omitted. Good stables and sheds should be erected, and every consideration should be given to home conveniences, especially regarding the appointments of the kitchen and washhouse. When the busy seasons had finished the boys and girls should be given a holiday, and allowed to take an interest in some form of recreation. If the above suggestions were carried out, and the young people encouraged to bring their friends home to spend a musical evening, the speaker believed much would be done to make farm life more attractive. In the discussion that followed Mr. C. Boundy agreed with the writer, especially in interesting and explaining farm matters to the young people on the farm. It was also a splendid idea to give them a small share in the crop, &c., but strict care should be taken in paying them the money obtained from the sale of any stock belonging to them. Mr. A. L. Vanstone considered that the concessions should also apply to the farmer's employees, especially in regard to providing comfortable quarters, and as many home comforts as possible. Mr. J. H. Boundy thought that not enough attention was given to obtaining all the labor-saving devices possible for the benefit of the women folk on farms. It was unusual to see a farmer deny himself in that

respect, therefore, the women should be considered as well. In reply, Mr. Carmichael said he quite agreed with a previous speaker in regard to the treatment employees should receive. It was his opinion that it paid to give an employee a small share of the products of the farm in addition to his wages.

#### BRENTWOOD.

October 20th.—Present: 18 members and two visitors.

"FARM MANAGEMENT."—In the course of a paper under the title "The Most Profitable Method of Working a 1,000 Acre Farm," Mr. A. E. Twartz said 250 acres should be fallowed and sown with wheat, 250 acres of stubble land could be sown with barley and enough oats to provide fodder for the stock of the holding; that would leave 250 acres for fallowing and 250 acres for feed. Under that system 500 acres would be cropped every year. Referring to the working of the soil, the speaker said during March the stubble land should be ploughed, and if summer rains were received it would be advisable to work the fallow at seeding time. A combined cultivator and seed drill would enable the farmer to get his seed in early. Fallowing should be commenced as soon after seeding as possible, then land then harrowed down and worked again in the spring. If time permitted, he advised harrowing the fallow after each fall of rain. He was of the opinion that a farm could not be worked to the best advantage if sheep were not kept. For that district he preferred the Shropshire or Dorset Horn cross, mated with ewes from a Lincoln-Merino cross. Pigs were also a profitable sideline, and the waste products of the farm could be marketed through them. Poultry were another source of revenue, and with proper care and attention they would bring in a good return. Two or three cows should be kept to meet the requirements of the homestead. He was of the opinion that breeding horses for sale would not prove a profitable venture unless good brood mares and an entire were kept on the property. The erection of a windmill and the laying down of pipes for the convenience in watering the stock would prove a great saving in time and labor. In the discussion that followed Mr. R. Anderson considered it would prove profitable to keep more cows than advocated by the paper. Mr. Carmichael thought three men would be needed to work the farm. He thought it would be difficult to breed fat lambs as well as keep sheep to feed off the fallow. He agreed that the crossbred ewe made a good mother, but the low price of crossbred wool made it necessary to keep Merinos. If breeding for the fat lamb market he favored the Dorset Horn-Merino cross. In reply, Mr. Twartz considered that to make cows pay as a sideline it was necessary to keep at least eight, but if one had to employ outside labor to do the milking it would not pay, as the farmer himself could more profitably employ his time. In regard to sheep, there were always market fluctuations, one time in favor of wool, another in favor of mutton, but in his opinion a farmer should decide what he intended to aim at—meat or wool—and then breed along those lines.

#### KILKERRAN.

September 15th.—Present: six members.

BREEDING AND CARE OF PIGS.—"I am of the opinion that it is a good policy and a payable proposition to keep pigs on the farm," said Mr. A. H. Cogan, in a paper dealing with the above subject. Continuing, the speaker said the sties should be built of stone with cement floors, the latter to have a slight slope to provide for proper drainage. Straw should be used for bedding, and after being in use for some little time it should be burned. He considered it advisable to have separate enclosures for the breeding sows at farrowing time. When that event was to take place, the bedding should be reduced to a minimum, so that the risk of the young pigs being crushed by the sow would be avoided. It was an excellent plan to have a small paddock adjacent to the sties planted with Cape barley. That would effect a saving in the feeding costs, and provide the animals with a place for exercise, which was so necessary for the health of the pigs. Of the many good breeds that could be selected by the prospective pig raiser, he favored the Berkshire. They matured more quickly than many of the other breeds, and were also an excellent bacon pig. If one desired a cross, he suggested the



Berkshire-Poland China. The progeny from that breed would prove good baconers, and cost very little to fatten for market. At nine weeks old the young pigs could be weaned, and fed for a while on milk. Pollard was a good weaning food, and as the pigs grew older a little barley could be added to their food. With a little care and attention the pigs would prove a very profitable side-line, and he could not understand why farmers did not breed pigs more extensively. In the discussion that followed, members were of the opinion that soaked grain was better than dry cereals for fattening purposes. It was stated that a tobacco solution, or fresh lime water, was an effective remedy for dealing with lice on pigs.

**THE TRACTOR ON THE FARM.**—At a further meeting held on October 13th, the Hon. Secretary (Mr. B. A. Koch), who contributed a paper on the above subject, expressed the opinion that in the course of the next 10 years nearly every farmer would be working a tractor. The present-day tractor was quite capable of handling any farm implement, providing that the land was not too rough and stony. If the soil was very sandy it would be necessary to fit wider wheels to the machine. He believed that where a team of horses and a cultivator would do good work, the same results could be obtained with a tractor. Another point in favor of the tractor was that it could be worked for 24 hours a day if so desired. He had found that the best way to work a tractor was to keep it going all day. With a seven-furrow plough and a tractor, he had broken up 42 acres of land in two and a half days, and had cultivated 35 acres in one day with a 9ft. implement. In addition to the above-mentioned points in favor of the tractor, the farmer would not be troubled with a heavy set of swings to take from one implement to another; it could be stored in a shed, and would take up no more room than one horse; it required no attention on Sundays and other holidays, and could be used for the same kind of work as a stationary engine. In reply to a question from Mr. Heinrich as to the cost of ploughing an acre of land with the tractor, Mr. Koch said 4s. worth of fuel and oil were required to do one acre of land.

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## MAITLAND (Average annual rainfall, 20.08.).

November 5th.—Present: 11 members.

CONVENIENCES FOR THE HOUSEHOLD.—In the course of a short paper under the heading, "Lightening Household Labors," Mr. E. R. Kelly said if any machine or implement was required to lighten the work on the farm it was usually procured regardless of cost, but too frequently no thought was taken of the arduous duties performed by the women folk in the house. Water laid on to the kitchen close to the stove would save the women a good deal of walking and heavy lifting. Washing was one of the heaviest duties performed in the household, and the installation of a machine for the work would save a good deal of time and hard rubbing. A small one-horsepower engine could be secured and harnessed to the machine and wringer. It could also be used for turning the wheat pickler, the grinding stone, &c. Washing troughs with a tap over each and a tap over the copper would be appreciated by the women. Plenty of wood for the stove and copper should always be available. For such conveniences a roomy washhouse would be necessary. The house should be free from draughts, well lighted, and provision made for plenty of ventilation. Several reliable electric light and power plants for use in country homes were on the market, and the installation of one of these would be appreciated by all. Besides providing light for the home and stables, the power could be utilised for driving the sewing machine and the butter churn. It could also be used for ironing purposes and driving an electric fan.

## MOONTA (Average annual rainfall, 15.22in.).

October 22nd.—Present: 14 members.

PROFITABLE SIDE LINES FOR THE FARM.—Mr. C. E. Atkinson, who contributed a paper on this subject, said, with the exception of sheep, the majority of the other side lines, such as pigs, cows, and poultry, were practically neglected sources of revenue on many of the farms in Moonta and the surrounding districts. The writer said he intended to take a farm of 640 acres of the best land in their district to illustrate what could be done with side lines. The first point to give consideration to was the subdivision of the holding. He suggested two paddocks of 150 acres each, two of 100 acres, and two of 50 acres. The remaining 50 acres could be fenced off into enclosures, containing from 5 acres to 10 acres each. Of the whole area, 250 acres could be put under wheat, and off that one should be able to cut sufficient hay for the stock on the farm. Two hundred and fifty acres should be fallowed, and the balance sown with barley for feed. Managed on such lines, the farm should be able to comfortably carry 150 sheep throughout the year, especially if pastured as much as possible on the land intended for fallow. Again, the sheep should be allowed to run on the fallow to keep down the growth of weeds. If arrangements were made for the ewes to lamb in May, good prices could be usually obtained for the lambs at the September and October markets. Dairying could be made a very profitable undertaking on the farm, but it should be remembered that the cow, even when on good pasture, required supplementary feeding. One of the principal points in the ultimate success of the dairy was the careful selection of the cows. Unless a cow was able to produce 10lbs. of butter a week for 40 weeks of the year she should be passed out of the herd. Poultry were also worthy of a place on every farm, and for profitable egg production he suggested a good strain of White Leghorns. Geese and turkeys could also be given a trial. The keeping of pigs he considered to be the most neglected side line on the farm. Pigs were not the dirty animals many people supposed them to be, but rather the dirty animals they were forced to be. Pigs required a run of at least five acres, and the farmer who intended adopting side lines should not overlook the important point of providing small paddocks for the pigs, and at least two of these should be set aside for the pigs. The sties could, with a little forethought, be so selected as to be cool in summer and warm in winter. At eight weeks of age the young pigs should be weaned and fed on soft food, with the addition of a little grain, for about five weeks. The following summary was given by the writer of what could reasonably be expected from a farm of 640 acres in the Moonta district:—Two hundred acres of wheat, yielding 24bush. per acre, 4,800bush.; 50 acres of hay, yielding 1½ tons per acre, 75 tons; 250 acres of fallow, six months fallow, six months grass, and 50 acres of green barley should produce 1,200lbs. wool and 100 lambs; 50 acres of barley, reaped for pigs, yielding 20bush. per acre,

1,500bush.; 10 acres for pig paddocks and 60 acres of green and dry barley should give a return of 2,500lbs. of pork. This leaves 35,000lbs. of barley to feed to breeding sows, fowls, and sheep. Two 10-acre paddocks of barley for horse paddocks; 5 acres for house, garden, stable, sheds, and poultry yards. The garden should produce sufficient fruit and vegetables for the home. Five acres of barley for cattle, giving a return of 2,000lbs. of butter.

PASKEVILLE, October 18th.—Mr. J. Bussenchutt contributed a paper, "The Preparation of Seed Wheat and Other Cereals Previous to Seeding," and an interesting discussion followed. A report of the meeting of the Yorke's Peninsula Field Trial Society, held at Bute on September 30th, was given by the Chairman (Mr. G. H. Baumann).

## WESTERN DISTRICT.

### CLEVE.

October 11th.—Present: seven members and visitors.

HINTS FOR WORKING THE FARM.—A short paper on this subject was contributed by Mr. Clem Hamilton, special prominence being given to the following points:—Small paddocks near the homestead for the use of ration sheep, mares in foal, and the rams and stallion. Gates instead of wire panels at entrances frequently used. The growing of more varieties of rust-resistant wheats in the district. The advisability of guarding against early dry spring weather by early seeding operations, well-worked fallow, and the sowing of early and mid-season varieties of wheat. The reports of the delegates to the Annual Congress were also received.

### McLACHLAN.

October 29th.—Present: 12 members and visitors.

GARDENING WITHOUT IRRIGATION.—Mr. E. G. Hetzel, who contributed a paper on this subject, said all winter vegetables could generally be brought to bear profitably if the soil was kept in proper condition. From experience he had found that August was the best month in which to transplant onions. The soil should be well worked and manured, and kept free from all weeds. The soil should be cultivated before planting, and care taken that all plants were put in very shallow. When ripe the onions should be pulled and tied in bunches, and hung under a shed where there was no danger of their getting wet. Like onions, carrots should be sown in sandy soil. No transplanting would be needed. The plot should be well manured and kept free from weeds. If fresh manure was used, it should be dug into the soil at least six months before sowing. The tops of the carrots should be trodden down four or five times during the growing period, otherwise they would in all probability go to seed. Cabbages were very easily grown. The soil should be well worked and manured, and the seeds sown in April so that the plants should be ready for transplanting during the first winter rains. It was necessary to keep the weeds in check, and before the hearts commenced to form the land should be well hoed. For the winter he recommended Henderson's Surprise, and for the summer Giant cabbage. The latter should be planted at least 3ft. apart. For the successful culture of red beet transplanting was necessary, and good returns could be obtained by using fresh manure. White and yellow turnips would give the best returns if planted on a piece of the fallow. Potatoes would also do well with stable manure. He was of the opinion that the best results would be secured by cutting the seed prior to planting. Grape vines flourished in their district if planted on the slope of a sandy ridge. To ensure a good crop of grapes, thorough cultivation and systematic pruning was essential. The holes for the fruit trees should be made at least 3ft. deep and 3ft. square. After the tree had been planted the hole should be filled in with surface soil. He believed it a mistake to place the soil that had been taken from the bottom of

the holes close to the roots of the tree. If the holes were excavated about three months before the trees were planted the trees would make a strong early growth. A very fine exhibit of vegetables and a box of strawberries grown without irrigation were tabled by Mr. Hetzel.

#### ROBERTS and VERRAN.

September 5th.—Present: eight members.

**LABOR AND POWER ON THE FARM.**—In the course of a paper dealing with this subject, Mr. A. J. Cowley said labor and power constituted the most expensive items in the cost of production, but they were the most profitable if managed correctly. If maximum production was the aim of the farmer, the power plant should not be outbalanced by the producing capabilities of the farm, nor by the mediums of transmission. It was not always possible to maintain an ideal balance of power, but that should be the object in view. A great amount of non-productive work such as destruction of shoots, weeds, and vermin had to be done to fortify and protect the fruits of production. The erection of fences did not make crops grow, neither did it fatten stock, but it did enable the harvester to gather more profit and the stock to have feed which otherwise would have been destroyed. Such points were obvious, and they should be applied to all the operations connected with agriculture. The secret of successful tillage and crop raising, rested largely upon having a power plant of capable implements, suitable for doing the different classes of work. One should not lose sight of the fact that the horses had to be fed throughout the greater part of the year, and unless they could be maintained through the idle months at a very low cost, it would not pay to keep a team large enough to do the seeding, harvesting, and fallowing. Practically the same could be said of the mistake of having the farm overmanned. Regarding the exact number of men and horses required to successfully work a given area of land, the speaker thought no definite rule could be laid down, as every farmer had to manage his own property, but by way of making an illustration he intended to deal with a holding where 300 acres and upwards of wheat, with the necessary oat and other feed crops were sown; and the usual side lines carried on. For such a holding he considered two men and a team of 10 or 12 horses of full working strength were required. In addition to the working team, a spare horse or two for emergencies, and also light animals for riding or driving would be needed. With horses to the number of 12 or 14, it would be most important that a portion of the fallowed land should be set aside for the growing of a hay crop. With regard to the number of sheep that could be kept, the farmer would have to take into consideration the fact that certain of the best paddocks would have to be reserved for the horses during their "slack time." The team when at work, required feed of the best quality, and it would be found necessary to add concentrates to the ordinary feed and roughage. Fortunately, they had at their disposal, an almost ideal form of concentrate in oats, which they were compelled to grow in fairly large quantities for cleaning and maintaining the fertility of the wheat land. In whatever way the horses were being fed, one of the main points to be observed in keeping them up in condition and at the same time making the best use of the feed, was regularity. Regular hours for feeding, watering and working, a regular pace in driving, and regular quantities and quality of the feed, meant more to the horse and his efficiency than many farmers realised. The greatest team strength per man, with the greatest amount of cultivation, and expeditious methods of harvesting, without neglect of work, should prove of the greatest profit to the farmer. In the discussion that followed, Mr. Evans thought the power required to work a given area of land depended entirely on the nature of the soil. He agreed that at least two men would be required to cope with 300 acres of wheat, and the numerous odd jobs that inevitably accompanied farming operations. On new land it was not necessary to devote a great deal of time to cultivation; the important point was clearing the scrub. As clearing operations were gradually dispensed with, more time could be devoted to better methods of cultivation, which would still necessitate the employment of the same number of men. Mr. G. Drayton said he was pleased to note that economy was a strong point of the paper. He advised feeding the horses on chaff, thereby eliminating the waste that frequently followed when the animals were given long hay.

## ROBERTS AND VERRAN.

October 19th.—Present: nine members and visitors.

**SHEARING.**—Mr. Geo. Drayton, who contributed a paper on this subject, said where the farmer kept from 200 to 500 sheep, it was not necessary that a shed should be erected solely for the purpose of shearing. When the barn was erected the farmer should have in mind the using of the shed for other purposes than that of storing grain. When the building was being constructed, he thought it would be a good plan to leave a few portholes in one side of the wall, so that when the sheep had been shorn they could be passed out into a separate pen from that holding the unshorn sheep. Another point that had to be considered was that of the yarding accommodation for the sheep in the event of rain falling. The yard should be supplied with grating instead of a solid floor, so that when the sheep lay down their fleeces would not become stained and dirty. For putting down the grating in the barn, sections of the floor should be laid down on the trap-door system. Such a plan would enable the flooring boards to be taken up and the gratings placed in the spaces set aside for the floor of the pens. If the sheep were crutched at least twice a year, a considerable amount of time would be saved at shearing, and much would be done to prevent the sheep from being struck with the blowflies. That work should not be overlooked, especially in the case of ewes rearing young lambs. The crutching would also keep a larger portion of the wool free from stain. A preference was expressed for the Merino breed of sheep, for he contended that they grew a good fleece, and they did not worry the fences to the same extent as other breeds. Plenty of hands should be engaged during the shearing operations to keep the wool clear of the shearers and also to sweep the board after each man had completed a sheep. When learning shearing the young man should in the first place make up his mind to do the work thoroughly, and not try for a "tally" until he was quite competent, and knew the different

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methods of holding the sheep and cutting the fleece. A convenient place for holding the shears could be made by placing a strip of leather above the porthole. The leather could be fastened with nails driven into the wood sufficiently wide apart to take a pair of shears. A pot of Stockholm tar was necessary in every shed for applying to any sheep that might be cut whilst being shorn. For farm flocks the speaker preferred shearing with the blades. After the wool had been taken off the old sheep should be culled out and branded for killing or marketing. The branding should be performed immediately after shearing, and the value of ear-marking should not be overlooked. In the discussion that followed, Mr. F. Masters said economy in shearing operations could only be obtained by employing skilled hands. He agreed with the speaker that learners should first of all learn to do the work properly before attempting to shear a great number of sheep in one day. Speed would come with practice. He did not think any great advantage was to be derived from crutching. Mr. A. J. Drayton spoke of the benefits the farmer would derive if he had a rudimentary knowledge of classifying the clip. The wool would be placed before the buyers in a better condition, which meant that the farmer would receive a better return for the clip. Mr. M. Masters thought the shearing of the lambs should not be overlooked. When that was done it improved the quality of the next year's fleece. Mr. H. A. Simmons then read a paper, "Stripper versus Harvester."

#### SMOKY BAY (Average annual rainfall, 13.06in.).

September 17th.—Present; seven members.

FENCING.—The monthly meeting of the Branch was held at Mr. A. McLean's residence. In reply to a question from Mr. J. W. Blumson as to the best specification for a sheep-proof fence, Mr. G. Crocker recommended the following:—The posts should not be more than 12ft. apart, with one barb and five plain wires. The lowest wire should be 7in. from the ground, the plain wires 6in. apart, and the barb wire 10in. from the top wire. If the posts were more than 12ft. apart titree droppers should be used. In connection with the annual road day, mention was made of the good results obtained by placing a thick layer of cocky chaff on the roads. Mr. J. W. Blumson stated that he had been picking ripe tomatoes for some considerable time. The bushes had been grown in the open, with no other protection than that obtained from walls or fences.

#### YEELANNA.

September 24th.—Present: 12 members.

FALLOWING.—Mr. J. Lawrence, who contributed a short paper on this subject, suggested the use of a plough with a P foot for fallowing. Two horses to each furrow should be worked in the plough, so that a strong draught could be maintained. If that was done a large percentage of the roots would be pulled out, which would considerably lessen the work of shoot-cutting. When the fallowing was completed a heavy set of harrows should be brought into operation, and if the weeds became troublesome the sheep could be run on the fallow to keep the rubbish in check. If rain fell about October, the fallow should be worked back with a tyne cultivator, and if the soil had not set down hard at seeding time all that would be needed was a working with a heavy set of harrows before the drill. Members were in accordance with the views of the writer of the paper, and believed that the better methods of cultivation that were being adopted were responsible for many of the fine crops in the district.

At a further meeting, held on October 24th, Mr. Wilkin read a paper, "Bulk Handling of Wheat," and a lengthy discussion followed.

COLLIE, October 15th.—Mr. J. W. Lynch gave an interesting account of a recent trip through the Gawler Ranges. The Hon. Secretary (Mr. A. P. Rowen) read a paper from the *Journal of Agriculture*, "The Soil," and an interesting discussion followed. Mr. J. H. Shipard tabled the model of a contrivance for preventing gates from sagging. Matters in connection with the forthcoming Minnipa Conference were also brought forward for discussion.

**COORABIE, October 15th.**—An interesting discussion took place on the prevalence of "take-all" in the district. It was resolved that samples of affected plants should be sent to the Professor of Botany at the Adelaide University. Mr Nicol reported the loss of several sheep through eating certain plants that were growing on his property. It was finally decided to send some of the plants to the Department of Agriculture for identification in order to ascertain if the weeds contained any poisonous properties.

**ELBOW HILL, October 8th.**—Mr. P. G. Wheeler gave an interesting account of the Annual Congress and the September Show. Several subjects of local interest were also brought forward, and an interesting discussion followed.

**MILTALIE, October 15th.**—After the formal business of the meeting had been transacted the Hon. Secretary (Mr. W. G. Smith) gave an interesting report of the Short Course for Farmers that had recently been held at Roseworthy Agricultural College.

**SMOKY BAY, October 15th.**—The monthly meeting of the Branch was held at Mr. E. Lovelock's homestead. During the afternoon members inspected the experimental plots, when it was noticed that the land that had received the heaviest dressing of manure showed signs of yielding the best crops. Considerable discussion also arose regarding the conservation of water. Some members advocated the use of concrete drains, while others thought better results would be obtained from off the rocks. The report of the delegates to the Annual Congress concluded the meeting.

**TALIA, October 15th.**—An interesting discussion resulted from the reading of the Departmental Bulletin, "Some Diseases of Wheat Crops and their Treatment," prominence being given to "take-all." A discussion also took place on the high freight charges on goods shipped from the mainland and Eyre Peninsula.

**YADNARIE, October 11th.**—Mr. A. C. Kruger delivered a full and detailed report of the Farmers' Winter School that had recently been held at Roseworthy Agricultural College. Messrs. Dolling and Forbes (delegates to the Annual Congress) gave an account of the proceedings of the various sessions. Mr. A. J. Jericho gave a description of the two years' fallowing system as practised in Victoria, and an interesting discussion followed.

## EASTERN DISTRICT.

### (EAST OF MOUNT LOFTY RANGES).

**CLAYPAN BORE** (Average annual rainfall, 16in. to 17in.).

October 19th.

**HAYMAKING.**—"The first work in connection with the preparations for hay-making is to see that the binder is in perfect order before taking it into the field," said Mr. P. Duffield in a paper under the above heading. Duplicate parts to those in the machine that were showing signs of wear should be on hand, so that in the event of a breakage no time would be lost by having to send for fresh parts. If oats were to be cut for hay the crop should be harvested when a reddish tinge could be noticed on the plants. If a large area was to be cut it would be advisable to commence operations a day or two earlier than the stage mentioned above, because the oats at times turned from a hay crop into one that could be harvested for grain in the course of three or four days. If the hay was to lie in the paddock for any length of time large upright stooks should be made directly after the binder. If the sheaves had not been stoked and a heavy fall of rain was received, no time should be lost in making small stooks that would provide for a free ventilation of air between the sheaves. Wheaten hay when cut for hay should be somewhat on the green side, and stoked in a similar way to the oats. The hay should be properly preserved after being in the stooks from 12 to 14 days. When preparing for stacking, care should be taken to have the measurements as square as possible, otherwise difficulty would be experienced in completing the

stack. As an example, a stack measuring 15yds. by 6yds., put up to a height of 30ft. to the ridge cap would be capable of containing from 35 tons to 40 tons of hay. After the land had been measured out a small stick should be placed at each corner to serve the purpose of a guide in building. The following method of erecting the stack was then suggested by the writer:—Commence by laying the first row of sheaves around and tying in with the heads overlapping the bands of the sheaf, and fill up to measurements. Before building around again place another layer of sheaves, heads overlapping the bands of the building sheaves, and fill up to the middle. This will raise the middle of the stack to a gradual slope to the outside of the stack, for it is necessary to have the middle of the stack at least 2ft. higher than the outside, at the same time taking care to have the slope as even as possible to the outside of the stack. As the stack is going up it is necessary to give the sides a tendency to lean outward, so that when the stack is completed the water from the roof will run off, instead of down into the sides of the stack. This can be obtained by building with the sheaves placed on an edge. When the stack is up high enough to roof, fill the middle well up, so as to give the roofing sheaves as much slope as possible. Next put a layer of sheaves around about 3in. or 4in. over the sides of the stack, and then gradually draw each layer of sheaves in until the ridge of the stack is completed. Then peg or tie each sheaf of the ridge, to prevent the wind from getting under the last sheaf placed in position. In roofing, I think butts out the most profitable, as with heads out such a lot of grain is wasted by the birds and weather, although more slope is required to run the water off with heads out than butts. I prefer building round-ended stacks to square ones, as they are easier to build and also easier to take out when pulling the stack down.

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## GERANIUM (Average annual rainfall, 16in. to 17in.).

September 24th.—Present: 17 members and visitors.

FODDERS AND THEIR CONSERVATION.—In a paper dealing with this subject, Mr. R. C. Jacob considered the growing of fodders and their conservation, one of the most important phases of agriculture. Reserve supplies of fodders was the best insurance against the inevitable droughts that visited the State, and so terribly depleted the stock. The systematic growing, conserving, and feeding of fodders to stock had not yet become a general practice in Australian farming methods, but as older, richer, and wetter countries had undoubtedly been forced to adopt these methods to increase and maintain the fertility of productiveness of their farms, it was reasonable to assume that inevitably the farmers of Australia would be forced to follow suit. The association of livestock with farming under correct methods of cultivation and manuring had proved in all quarters to not only maintain and improve the fertility of the soil, but also to increase production and add to the profits of the holding. In the mallee districts there was no lack of evidence of the crying need for the introduction of more stock. The prevalence of take-all in those districts and the necessity for growing oats to combat the disease naturally gave prominence to the question of handling oats to the best profit. Selling as grain in most cases did not yield very large profits, but the feeding of that crop to stock, either by grazing, ensilage, hay, or grain, held out inducements that commended themselves, especially in view of the very evident fact of the way the land in the district responded to manuring. On any farm in the mallee districts one could not fail to notice what a marked difference there was in the growth of feed and crops around the homestead where manure was spread, or where extra stock had been pastured. Their land required building up, and as they had a splendid climate and good rainfall, with a retentive subsoil, he maintained they could improve the fertility of the soil. The soil responded quickly to manuring, both artificial and natural. Oats and peas grew remarkably well, and, with dressings of super, the crops would give more growth and more feed that would increase the stock-carrying capacity of the farm. One of the main points to be observed in the successful carrying of stock was that the farm should not be over stocked. Quite a number of grasses did well in their district, those that he had proved successful being lucerne, Bokhara clover, perennial canary grass, rye grass, Paspalum, and Evening Primrose. The report of the delegates to the Annual Congress was then received and discussed.

## RENMARK (Average annual rainfall, 10.93in.).

October 23rd.—Present: 54 members.

SPRAYS AND SPRAYING.—The Manager of the Berri Experimental Orchard (Mr. C. G. Savage) read the following paper:—To combat satisfactorily any fungus disease or insect pest one must know something of its life history, and in the case of the insect the method in which it takes its food. The fungoid diseases are divided into two divisions:—(1) Those that are external and known as epiphytic fungi, such as the oidium or powdery mildew. (2) Endophytic: those fungi which live in the internal structures of the plants, such as downy mildew and black spot of the vine, peach leaf curl, scale of apple and pear, scab or shot-hole of apricot, plum, &c., prune rust. The insect pests are sub-divided into two sections:—(1) Mandibulate or chewing insects. Examples—Codlin moth, Curculio beetle, cut worms, banded pumpkin beetle. (2) Haustilate or sucking insects. Examples—Scale insects, aphides, Rutherglen fly, red spider. The secret of successful spraying is thorough work. One may have the correct spray washes and apply them at the right time, but may defeat the object by careless work in applying the insecticide or fungicide to the plants. *Epiphytic Fungi*.—Oidium.—The first division of the fungoid diseases represented by the powdery mildew or oidium can be treated at any period throughout the growing months when it makes its appearance. The disease is external, and sends its root-like growths through the stomates of the leaves, the tender shoots, and developing fruits to the internal cells, and draws upon the food supply of the host plant. The approved remedy for this disease is to dust the vines with flowers of sulphur. The heat of the sun causes some of the sulphur to vaporise, and the fumes passing through the vine

destroy the fungus. The sprays used to combat downy mildew will also keep oidium in check. The ploughing under of sulphur sometimes recommended for oidium is a waste of material and time. That it gives good results is doubtless true, but those results are due to the vaporising of the sulphur turned up by the plough, and a little sulphur dusted on the vines will cost less and do better work.

*Endophytic.*—All these diseases are kept in check by the same spray washes, with the exception of the anthracnose, or black spot of the vine, for which the winter treatment with acid-iron solutions is essential. The summer treatment is to spray with the approved copper mixtures recommended for other fungus diseases. Applications of fungicides for endophytic fungi are purely preventive, as once the disease enters the tissues of the plant it cannot be destroyed without destroying the affected part. This being the case one must study the conditions and times under which the spores are most likely to germinate and coat the plant with a fungicide before the spores germinate. In the case of downy mildew the first appearance, according to the limited data available in this country, is likely to occur about the middle to the end of October. Thus the first spraying should be applied before the middle of October, and a second one about two or three weeks later. Under our Murray River climatic conditions, except under exceptional damp weather conditions, it is questionable whether a third application will be necessary, but under weather conditions such as were experienced in our last summer (1920-21), a third application would in most instances be essential. An earlier application for the black spot fungi of the vine is advisable than the one given in early October for downy mildew. The subsequent sprays for downy mildew will aid in controlling re-infection from the summer spores of the black spot. Peach leaf curl fungus can be controlled by spraying with copper mixtures when the pink of the blossoms is just showing through the bud scales. The apple and pear trees should be sprayed before and after the flowers have opened. An autumn spraying will probably be found sufficient to keep the shot hole fungi under control. This spray will also help to check the plum rust. A further spraying should be given in the spring.

*The Copper Spraying Mixtures.*—The diversity of opinion as to which is the best mixture to apply, and whether it should be alkaline or neutral, and if a spreader is necessary, and if so which one should be used, opens up a big field for discussion and experiment. With the object of testing various formulæ, several spraying experiments are being conducted at the Berri Experimental Orchard this season, and the results will be published in due course. The standard Bordeaux mixture is made on the following formula:—6lbs. bluestone, 4lbs. lime, 50galls. water. Under most conditions this will give good results. The solutions of bluestone and lime must be made up separately. They can for convenience be made up as strong stock solutions. Before mixing the solutions dilute them down. Never bring two strong solutions together. When two strong solutions are mixed a very heavy precipitate forms. This can never be broken down, and consequently the distribution over the foliage of the vine is somewhat uneven. The method that is usually followed is to dissolve the bluestone in half the water by suspending it in a piece of cloth just under the surface. The water immediately surrounding this dissolves a portion, becomes heavier than the rest of the water, and consequently falls to the bottom of the vessel. Thus a constant circulation is kept up until all the bluestone is dissolved. Should the bluestone be thrown into the bottom of the cask the water immediately surrounding it soon becomes a concentrated solution, and the rest of the bluestone remains undissolved. The lime should be fresh. It is slackened gradually by the addition of water, just before spraying is to commence, until it is of the consistency of milk. It is then added to the second barrel and diluted with half the quantity of water, say, 50 gallons, where 100 gallons of mixture is being made. The two solutions are then run together into a third vessel, which in most cases is the spraying pump vat. Care must be taken to see that the lime water is well strained to remove any particles of grit that would clog the nozzles. By this method a very fine precipitate is formed, which spreads evenly over the tree or vine. Standard Burgundy mixture is made on the following formula:—6lbs. bluestone, 9lbs. washing soda, 50galls. water. The bluestone and the soda are dissolved separately and mixed just before spraying on to the plants.

*Mixing of Copper Sprays and "Spreaders."*—In the making of Bordeaux mixture it has been lately recommended that the copper should always be added to the lime, and not lime to the copper, and that a strong solution of



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 All States and New Zealand.

copper should be poured into a weak solution of lime. In "Science and Fruit-growing," by the Duke of Bedford and Mr. Spencer Pickering, recording the results of the Woburn experiments, diagrams are published showing the precipitations induced when copper is added to lime and lime to copper in the form of strong, weak, and equal strengths and strong to strong. (The diagrams were shown by Mr. Savage.) But there is one method not shown in this book which, the speaker held, gives better results than any other. This will be found useful for either Bordeaux or Burgundy mixture. The barrels in which the copper and lime or soda solutions are made are connected by piping with the spray tank, into which each solution flows simultaneously. Neither solution is poured "into" the other, but they flow into the tank together and mix all the time. When one strong solution is poured into another strong solution—copper into lime or lime into copper—the result is a coarse and heavy precipitate of relatively small value for spraying purposes. A finer precipitate is obtained when the strong copper solution is added to a dilute lime solution, but, in the lecturer's opinion, the mixing together, in the manner described, of two dilute solutions gave a still finer precipitate, and rendered possible a more even distribution by means of the spray. Continuing, Mr. Savage said the use of "spreaders" was a vexed question. Treacle and sugar were at one time much in favor, but they were not heard of now in Australia. He was inclined to doubt whether spreaders, though probably very necessary in wet countries, were required under our climatic conditions. He thought the ordinary solutions would stay on long enough—the new growth soon outgrew protection and had to be sprayed again. Soap and casein had been recommended as spreaders, but soap was now accused of forming insoluble copper compounds. He presumed soft soap was referred to—he did not know what the action of resinous soap would be, and he had never used casein. Flour paste was highly recommended as a very simple spreader, and one not likely to cause trouble by the formation of insoluble compounds, and it mixed well. It had first come under his notice when spraying for red spider. It was useful in causing contact insecticides to stick. In preparing the flour paste, the American method would be found useful:—"Mix a cheap grade of wheat flour with cold water, making a thin batter without lumps; or wash the flour through a wire screen with a stream of cold water. Dilute until there is 1 lb. of flour to each gallon of the mixture. Cook until a paste is formed, stirring constantly to prevent caking or burning. Add sufficient water to make up for evaporation." When used with lime-sulphur for red spider, 4 galls. of the paste were added to each 100 galls. of the spray. He would make no definite statement concerning the respective merits of alkaline and neutral sprays, as they were testing the matter this year at Berri with an open mind. But he doubted whether the matter was of importance in this district. At the Blackwood Experimental Orchard, in a much damper climate than Denmark, they rarely troubled to test the mixture, and in a year with over 33 in. of rainfall, when a number of experiments with Bordeaux mixture for curl leaf of the peach were conducted, very marked results had followed the use of untested mixtures both of Bordeaux and Burgundy. Those experiments had included sprayings with Bordeaux paste (the so-called Woburn mixture) and copper sulphate solution—the last named could only be used as a winter spray on account of its burning action on the young leaves. The Woburn mixture was made with clear lime water instead of milk of lime. At the same time a test was made of the alleged virtues of a dressing of iron sulphate. Certain growers were of the opinion that the absorption of iron by the trees would confer immunity from fungoid disease. But it was found that whereas six trees sprayed twice with Bordeaux mixture yielded 14 diseased leaves, sprayed once with copper solution 17 diseased leaves, twice with Burgundy and Bordeaux paste no diseased leaves, three trees unsprayed, but each dressed with ½ lb. iron sulphate in the soil above, the roots gave 325 diseased leaves. In the following year stakes were driven on each side of one of these trees, supporting reagent bottles containing iron sulphate solution and fitted with stoppers and rubber tubes which were inserted into holes in the trees. In the course of three weeks about three gallons of the solution, containing half an ounce of iron to the gallon, had been injected into the tree. As a result two-thirds of the trees died, and from the remaining third over 2,000 diseased leaves were gathered. *Insect Pests*.—One convenient division of the insect pests was of those that were exposed only a short time and those that lived exposed. The codlin moth, for example, fed

for only a short time on the outside, and then bored into the fruit and made for the seed. If they were in doubt whether fruit had been attacked by codlin or some other grub the matter could be settled by cutting it open. If the codlin moth was to blame the core would be found eaten round. The question whether the female of the codlin moth could fly had lately been raised. The lecturer had hatched them in a bottle, winged and flying. A pear branch from which the petals had just fallen was exhibited by Mr. Savage, who said it was just at the right stage for spraying. The codlin moth laid its eggs anywhere, on the foliage or fruit. The grub might feed for a little while on the leaves, but soon made for the fruit. It was not particular where it entered the fruit, but a great number entered at the calyx, and therefore the first spray was timed to catch the calyx before it closed. A quince spray, with fruit on which the calyces were already shut, was also shown, with the comment that it was already too late for the first spray. It was too late when once the grub was inside the fruit. The grower should study his trees, and spray the early flowering ones first. Another method of dividing the insects was into chewers and suckers. The one was killed by poison and the other by contact sprays. Poison was no good for the suckers. With regard to the codlin, if they applied the first spraying at the right time and effectively, the result should be from 80 per cent. to 90 per cent. of clean fruit. The spraying should be thorough, and the fruit coated, otherwise it would be ineffective. On the river two or three sprayings would probably be needed to combat the moth successfully. There would probably be three broods of the moth and perhaps four, but the Williams pears would be off the trees before the fourth brood was hatched. The Curculio Beetle.—At Blackwood they had killed the curculio beetle with a strong spray—one in ten and one in five—of arsenate of lead. They used the powder, which was twice as strong as the paste. The beetle could be trapped by means of sheepskin bandages, or in zinc troughs round the tree with oil in them. The curculio was wingless, and lived in the ground by day, crawling up the stem at night and eating the foliage, young bark, and tender shoots. If they got an old umbrella with a split in it, and held it open inverted under the tree, shaking the tree or flashing a light would cause numbers of the beetles to fall into it, and they could then be destroyed in boiling water. The Cutworm.—The simplest method of dealing with the cutworm was to spray with a fairly strong solution of arsenate of lead. The main trouble was experienced when the trees and vines were small. The banded pumpkin beetle was easily killed with arsenate of lead. The Common Black or Olive Scale.—The usual remedy for this scale was a spray of red oil or kerosine emulsion. Care was needed to see that there was no free oil or kerosine in the spray mixture. It was a trouble to get a good emulsion of red oil in the absence of rain water, and it was always advisable to add soap extract or soft soap. The kerosine emulsion should be agitated well from one vessel to another. The ingredients of kerosine emulsion were 2galls. of kerosine and 1lb. of soap to a gallon of soft water, or a gallon of sour milk could be used instead of the soap and water. To make it, add the soap to the water, and boil till dissolved; then remove to a safe distance from the fire, add the kerosine, and agitate violently. One gallon of this stock solution would make 12galls. of the spray. Aphides.—Tobacco wash was the common remedy for the aphides, but a second spray should follow the first within 48 hours. The aphid bred with amazing rapidity, and only those were killed that were actually struck by the spray. For the Rutherglen fly he preferred benzine emulsion, made like the kerosine emulsion, with special care to keep the benzine away from the fire, and diluted up to 16galls. The red spider, so called, against which lime-sulphur or red oil was regarded as effective, Mr. Savage was disposed to think was not much to be feared on the river. The true red spider spun a minute web, under which it worked. What was known on the river as the red spider was the Bryobia mite. On the Adelaide plains he had seen prune and almond trees defoliated by that insect, but he had noticed that trees at Berri infested for three years with the mite and unsprayed had not apparently been affected by it. *General Purpose Sprays.*—As a combined insecticide and fungicide an emulsion of Bordeaux mixture and paraffin was recommended by Pickering. The lecturer suggested, however, that lime sulphur would be found the most effective general purpose spray. He could thoroughly recommend it for red spider, and it could be bought ready mixed. It was very objectionable, though not difficult, to make, and unpleasant to use. A combined spray to deal

with codlin moth and fuscladium could be made by mixing arsenate of lead and Bordeaux. The first spray for the fuscladium should be given just before the flowers opened, when the buds started to move, but the combined spray could be used with the first and second applications of arsenate of lead for the moth. The Bordeaux and arsenate mixture was safe, but Burgundy and arsenate would probably burn the trees. He had never used nicotine and arsenate of lead together, and could not speak of this mixture from experience, but would prefer to spray with them separately, and he thought lime sulphur or kerosine emulsion more effective against young scale than nicotine. In the discussion that followed the Chairman (Mr. F. L. McDougall) said there was some danger of growers becoming a little confused through the multiplicity of advisers. With regard to Bordeaux mixture, he understood it had been shown that the acid solution lasted the shortest time, the neutral a little longer, and the alkaline much longer. Mr. Savage said that was so. The neutral solution was used in winter because it was required to act quickly then. Mr. F. H. Basey thought the method of mixing the lime and copper for Bordeaux very important. Mr. Savage had recommended the addition of medium to medium, but Pickering showed that the addition of strong copper to weak lime gave better results than medium to medium. He had been following Pickering's recommendation. He first made a strong mixture of lime, then added practically the full quantity of water, and topped up with a strong copper solution. Mr. Savage explained that he did not recommend adding lime to copper or copper to lime, but ran the two dilute solutions into the vat together. It was not a case of adding one to another, but of mixing them equally. Mr. McDougall considered a spreader very necessary with arsenate of lead. He had seen casein recommended with milk of lime, to dissolve the casein and also to neutralise any acidity in the arsenate, and make it safe against scorching. Mr. Basey had used flour as a spreader two or three years ago, with satisfactory results. He had tried it with Burgundy, and as a result the leaves were well coated. He had only that day succeeded in making casein dissolve, and had given up all hope of dissolving casein with lime. Mr. Alexander was using casein with Burgundy. He put four gallons of the solution on the fire, brought it to between 170deg. and 180 deg., and added 20oz. of casein, which dissolved as quickly as sugar—though it would not dissolve with a lower temperature. He allowed it to cool off, and secured a very good spray solution, which gave a better wetting effect than the plain Burgundy, though not so good as soap. He poured casein in, and stirred it at the same time. He had been warned that it was possible to overdo the use of spreaders, which were inclined to coat the leaves with a varnish, and thus interfere with their breathing functions. Mr. Taylor said in a recent French work on viticultural practice it was claimed that the sweetened Bordeaux mixture was regarded as the best remedy against downy mildew. Mr. Basey thought the strength for Bordeaux recommended by Mr. Savage rather low. As high as 15lbs. of copper sulphate had been advocated, Mr. Buring said 10, Mr. Lyon 7, and Mr. Savage 6. Mr. Alexander wondered whether any harm would be done to the soil by the soda in the Burgundy. Mr. Savage thought the copper was more likely to do harm than the soda, although the latter might be injurious if muriate of potash had been applied to the land, by forming sodium chloride. Mr. Alexander said that, under advice from Mr. Showell, he allowed the Burgundy to settle for six hours, and then drained off 75 per cent. of the solution, replacing it with clear water before spraying. That, remarked Mr. Savage, was one of the methods advocated to get rid of excess of soda, and was among the experiments listed for trial at Berri during the current season. Mr. Morley-Taylor asked whether the lecturer considered the usually recommended strength of 1lb. of arsenate of lead paste to 20galls. of water, strong enough for codlin moth? Personally, he thought one in 15 better. The extra strength would not make the spray burn. Mr. Savage thought one in 20 barely strong enough. The usual strength nowadays was three in 50, approximately one in 16.

#### ROSY PINE.

Present: seven members.

**HOMESTRAD MEETING.**—The October meeting of the Branch was held at Mr. Schiller's residence. Members first inspected the orchard, which consisted of apple, peach, pear, plum, and almond trees. The trees were carrying a very good crop

of fruit, and Mr. Schiller stated that they had not received any artificial watering. The first crop of wheat inspected by the members was sown on grass land that had been ploughed with the early rains and then cultivated in June. The visitors estimated that the crop would yield 20bush. to the acre. The crops on the fallow were not so good, which members believed was due to the excessive wet season that had been experienced. A crop of oats standing about 4ft. 6in. high and very thick and even caused many complimentary remarks. It was generally admitted that the crop was one of the best of its kind in the district. Very favorable comments were made concerning the almost total absence of stumps on the property. The members were kindly entertained at afternoon tea by Mrs. Schiller.

#### TAPLAN.

October 22nd.—Present: nine members.

The meeting took the form of "Question Box," when several subjects of interest to agriculturists were brought forward and discussed.

VISIT TO VEITCH EXPERIMENTAL FARM.—On November 1st members visited the Veitch Experimental Farm. On arrival at the farm the members were met by the manager (Mr. L. Smith), when a tour of inspection of the buildings and stock was made. After dinner the crops and experimental plots were next visited. Some very promising crops were noticed, Gluyas and Baroota Wonder being to the fore. In the barley plots Tunis No. 4 showed up to advantage, and a fine crop of Algerian oats was seen. Keen interest was displayed in the manurial plots, the general opinion being that the plots dressed with 2cwt. of superphosphate had a decided advantage over both the 1cwt. and 3cwt. plots. Afternoon tea and votes of thanks to the manager concluded a very instructive and interesting outing. It was decided to try and make the visit to the Experimental Farm an annual fixture.

On November 10th a promenade concert was held, the proceeds of which it was intended to devote to the funds of the Bureau.

BARMERA, October 19th.—The Hon. Secretary (Mr. F. V. Burchell) presented the Annual Report and Balance-sheet, and the officers were elected for the ensuing year. It was decided that in future the Branch would meet on Tuesdays on or before full moon. The Hon. Secretary (Mr. F. V. Burchell) has advised that it is the intention of the Branch to inaugurate a fund for the purpose of providing prizes for the best kept block in the area.

BARMERA, November 8th.—The Horticultural Instructor (Mr. Geo. Quinn) attended the meeting, and delivered an address dealing with the subjects, "Grading and Packing Fresh and Dried Fruits," "Principles of Pruning," "Spraying," and "The Future of the Dried Fruit and Spirit Grapes Industries on the Murray."

GERANIUM, October 22nd.—The annual homestead meeting was held at Mr. F. A. Lillecrappe's residence, when members took the opportunity of inspecting the crops and stock. After an enjoyable and instructive trip around the property and neighboring crops the members and visitors were entertained at afternoon tea by Mrs. Lillecrappe.

GLOSSOP, October 12th.—Messrs. J. E. Hamlyn and T. V. Partridge (delegates to the Annual Congress) gave an interesting account of the proceedings of the various sessions. Seven new names were added to the membership roll of the Branch.

KINGSTON-ON-MURRAY, September 30th.—The evening took the form of a debate between members of the local and Moorook Branches, the subject being "Stone Fruits *versus* Vines in the Murray Valley." Messrs. Carne, King, and Sanders represented the Kingston Branches, and Messrs. Chaston, Farley, and Dixon were the home team of debaters. Mr. P. S. Stubbs adjudicated, and was unable to separate the contestants for winning honors.

LAMEROO, October 8th.—An instructive report of the Short Course for Farmers, recently held at the Roseworthy Agricultural College, was given by Mr. A. J. Keck. Reports were also received from the delegates who attended the Annual Congress.

PARILLA WELL, October 10th.—Messrs. D. B. Ferguson and E. C. Slater, who represented the Branch at the Annual Congress, gave an interesting report of the proceedings of the gathering.

PARUNA, September 12th.—On the occasion of the annual meeting the Hon. Secretary (Mr. G. H. Flavel) presented the report of the work performed by the Branch during the past year, and the officers were elected for the ensuing term.

WAIKERIE, October 12th.—The Poultry Expert (Mr. D. F. Laurie) attended the meeting and delivered a lecture, "The Poultry Industry," to a record attendance of members and visitors.

WILKAWATT, October 15th.—The evening was devoted to a discussion on the take-all investigation being carried out by the Department of Agriculture. The report of the delegates to the Annual Congress was also received.

WINKIE, October 10th.—After the report of the delegates to the Annual Congress (Messrs. C. Plush and H. Dalziel) had been received, the meeting took the form of a "Question Box," when several subjects relating to the establishment of fruit blocks were brought forward and discussed.

YOUNGHUSBAND, October 13th.—Mr. Brinkley, who attended the Short Course for Farmers at Roseworthy Agricultural College, gave an interesting account of the proceedings of the various lectures and demonstrations.

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# GET THE IDEA

“YOU HAVE TO GIVE TO GET”

# APPLY THE IDEA



## GIVE YOUR LAND HEAVIER DRESSINGS OF

## WALLAROO M<sup>1</sup>LYELL SUPER AND YOU WILL GET HEAVIER YIELDS



## SOUTH AND HILLS DISTRICT.

## ASHBOURNE.

October 17th.—Present: 20 members.

**AFFORESTATION.**—The following paper was read by Mr. W. Durward (Forester in charge of Kuitpo Forest):—Forestry, like agriculture, is pre-eminently applied science, and, therefore, its practice is governed by the economic needs of the time. While the science of forestry is well developed, and rests on a solid foundation of the so-called "natural sciences," its practical application varies in the different countries in accordance with their economic and political development. The progress of forestry and forest education has been dictated by the needs of time. In years gone by forest land and lumber were hardly of sufficient value to be worth claiming as personal property. The necessity for the cultivation of the forest became slowly recognised, and the control of the forests passed into the charge of skilled men. In middle Europe the beginning of forest education dates back to the close of the seventeenth century; in 1700 the University of Berlin established a course of lectures in forest economy. In France the scientific management of forests was not taken up until the eighteenth century. In 1895 the first school of forestry in Great Britain, that of Edinburgh University, was inaugurated. At the present time there are about 10 important schools of forestry in Great Britain alone. A country should go on importing as long as she can obtain timber cheaper by means of importation than is possible from internal production, provided there is no other reason against this policy, such as having forests standing which would be improved by a certain amount of cutting and use. A country should import until she can build up her own forests, with a view of becoming self-supporting, and possibly an exporter at a profit. Australia to-day spends £10,000 per day for timber. This might be well if she were building up her own forests in the meantime, but the building-up process, although going on, is very slow. The following brief summary will give some idea of the position of forestry in South Australia. Our imports in timber would in normal times amount to considerably over half a million sterling in value each year, and are steadily increasing. Our requirements in timber over and above this for firewood, fence posts, and general use in rural districts amounts to some hundreds of thousands of pounds each year, and this is increasing. In 1913 South Australia imported £11,000 worth of gums and resins, £29,000 worth of furniture, £163,000 worth of paper, and £14,700 worth of smoking pipes. In 1918-19 paper, £197,000; smoking pipes, £21,000. The idea that South Australia is not a good forest country, which prevailed up to within a very few years ago, has been shown over and over again to be the outcome of lack of knowledge, and now the idea is the greater the shortage the greater the necessity for forestry. Forestry is profitable. Some of our cultivated forests can be estimated to produce about 70 cub. ft. of timber per year per acre in their present condition when considered as a whole. If, therefore, 70 cub. ft. of timber grow to the acre each year in the forests, and before it can be cut to advantage it should be 40 years old, the quantity of timber produced per acre in 40 years is  $70 \times 40$  cub. ft. = 2,800 cub. ft. It is estimated that South Australia needs 1,000,000 acres of forest, so that the question naturally arises where can South Australia find 1,000,000 acres of forest? The answer to this can easily be given. Those who know this State know that anywhere where the rainfall is 20in. and upwards forest trees flourish. The following will show the area of South Australia having an average of 20in. and upwards:—Total area with rainfall of 20in. and upwards, 8,860,000 acres; total area with rainfall of 25in. and upwards, 2,635,000 acres; total area with rainfall of 30in. and upwards, 820,000 acres. One million acres equal 12 per cent. only of area within 20in. rainfall. From the above figures it is clear that, to give the agriculturist and pastoralist all he needs it will leave the wettest parts of the State ample room for a million acres of forest. We owe a debt to posterity, and should not fail to pay it; we have no right to use up all our forest wealth, and leave nothing for those who come after us. For instance—If a landlord lets a farm to a farmer there is always a clause inserted whereby the farmer is forced to leave the farm in the same condition as when he took it over. Should he fail to do so, he is fined and forced to pay. There is no direct fine for us neglecting to leave our forests in good order, but indirectly we are fined by having to pay extra prices for our

timber. If it pays a farmer to buy super to grow his crop, it will pay a bee-keeper to plant or broadcast gums, and save time in carting bees about. Mr. Durward also answered many questions, besides giving numerous explanations in the planting and management of forest reserves.

#### BALHANNAH.

October 14th.—Present: 17 members.

PEA GROWING.—The following paper was read by Mr. G. Edwards:—*Field Peas.*—The cultivation of peas dates back to prehistoric times, and there is evidence of them being grown by Romans and Greeks. They are a native plant of Rome, Western Asia, and through Syria and Palestine to the Himalaya Mountains. Seeds have also been found among relics of the stone age in Switzerland, and the crop has now spread to all parts of the globe where climatic and cultivation conditions are favorable. In countries like Great Britain and New Zealand, and even the moist parts of our own State show very little progress of recent years in the production of peas. There are many reasons why the majority of farmers do not go in heavily for pea growing, one being the simple fact that the crop does best in a cool, moist climate. Peas will, in the early stages, resist ordinary frosts, and in the dry weather will, although not being deep rooted, make full use of the water resources in the soil. The blooming period is the critical stage with frosts and rough, windy weather, and the crop will never set well if caught at that time. Other reasons for the unpopularity of the pea crop are the difficulty in harvesting, the long and tedious work, and the fact that it often necessitates extra labor. Then again, the wind will very often blow the cut crop to another part of the field, and a shower during the busy season means turning the crop well to ensure its being quite dry before threshing. Another obstacle to successful pea culture is the attacks from caterpillars and weevils that the crop is subject to. The latter is a small greyish or brown-grey beetle marked with lighter spots, which lays its eggs on the outside of the grain, and are so small as to appear like white spots on the shells. From these there hatch white grubs which burrow through the soft developing pea. The seeds usually become infected when nearly full grown, and as they ripen the wound made by the grubs has entirely healed. In many instances the grain is stored away, apparently in good condition, and if in a warm climate the grubs will continue to feed, and become full grown, and will then eat a cavity larger than themselves, and extending to the skin but not through it. At that stage the grub then changes into the pupa and later into the weevil, which has sharp jaws used like scissors, and cuts a circular flap in the pea; hence the round hole which is the first visible evidence of infected peas. The weevil dies unless it can find growing plants on which to lay its eggs. It is certain that the value of peas would never be realised as a general grain crop, but there is a great value in it for other purposes. As a fodder crop, when no other is available, it is invaluable. Peas occupy the ground a comparatively short time, and through the co-operation of bacteria replenish the nitrogen reserves in the soil. In wet districts they are regarded as a renovating crop, and should precede a cereal crop in rotation. A test of land planted with peas for 20 years showed an increase of 6cwts. of nitrogen per acre, equal to a dressing of 2cwts. of nitrate of soda per acre per year. This, at pre-war rates, means approximately 30s. per annum. No doubt the greatest benefit would be derived in districts of heavy rainfall, where nitrates are continually being leached from the soil. If sown in May or June, and allowed to come to the flowering stage, it is very valuable to plough into land intended for a potato crop, for besides adding valuable humus it replenishes the supplies of nitrogen. Peas may be grown on practically all types of soil that will take cereals. On rich flats they are inclined to run to straw at the expense of a grain yield, and in marshy land the plants will frequently rot at the base. They do not require high-conditioned soil, but there should be a fair amount of potash, phosphoric acid, and lime. The seed, being large, should be buried 2in. to 4in. deep, according to the soil and time of drilling. The amount usually planted is between 2bush. and 3bush. per acre. Peas are partial to lime, and if this fertiliser is used it should be applied in quantities of 3cwts. to 5cwts. per acre. Phosphates in form of superphosphate of lime, 1cwt. per acre in wheat areas; and in heavier rainfall districts, about 2cwts.

per acre of bonedust, bone super, or guano super are beneficial. On clay soil gypsum does much good by liberating potash and generally improving the soil.

**Machines for Cutting.**—I have made careful inquiries, and also had experience with different machines for cutting the peas, and find that a mower with a divider and cradle or windrow attached answers quite well. For Threshing.—Some people cart the pea crop and stack it in a spot convenient for future use. This process entails much unnecessary labor, also double handling of the peas, and is wasteful, as more peas are shaken out than need be. For some years I have cleared a floor somewhere near the crop paddock, and carted the peas there with a trolley and pair of horses, and threshed each load by that means. I find it much quicker than the old style roller, besides saving the extra horse and driver, and preserving the straw in a much better condition. After heaping up the peas and hulls, the winnower, bags, and scales should be taken to the field, and when the peas are cleaned and bagged and weighed the weight should be marked on each bag to facilitate handling for market. Every portion of the plant is valuable; even the roots help to build up the fertility of the soil. The grain is the most valuable of all farm seeds. Pea straw having almost as much value as oaten hay, is easily digested, but if fed to horses in large quantities may lead to flatulent colic or constipation. There is also a possibility of the system becoming overcharged with lime and phosphates, in which the straw is exceptionally rich. However, peas are a safe crop to feed.

**Pea Hay.**—When the first pods are just full grown is the best time to cut for hay, and in wet districts it is advisable to sow oats with the peas, as it helps the curing of the hay.

**Dairy Cattle.**—Ensilage made from peas is much richer in flesh-forming and milk-producing nutrients than that made from cereals.

**Cracked Peas or Pea Meal.**—Heavy stock should only receive half the grain ration, but the split or whole grain is better than the meal. Pea meal forming one-third of the daily allowance for milking cows increases the yield, and when the cows are heavy in calf it is advisable to halve the daily allowance. Hand-feeding Sheep.—

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Men spend their time and effort in acquiring property in order to achieve financial independence. To this end they engage their resources in business and other industries, or they seek safe and profitable investments. In all these activities they direct vigorous efforts towards the protection of their property. During their lives they endeavor to guard against every change which may lessen or damage their resources, but their plans for obtaining safety often fail to take into account the one thing which is sure to happen—the death of the planner. Many owners of property seldom consider how their property is to be managed after their death to support those for whom it is their duty to provide.

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Breeding ewes may be given equal quantities of crushed oats and peas, and the same will apply for forcing early lambs for market, although peas alone will answer quite well. Pigs.—The value of feeding peas to pigs is too well known to need much comment. Brood sows derive most benefit from them about farrowing time, and young pigs are primed up more quickly if penned up and fed on a pea ration. Peas as Grazing.—Although not gone in for very much in these districts, I think the value of peas is overlooked. Sown with other grain, such as barley, oats, wheat, or rye in a mixture of 1bush. to 1½bush. of both, sown alternately with other cereals, will provide an excellent grazing pasture. This system when applied to the feeding of large stock is wasteful, but for lambs and pigs it is payable. Store lambs should gain from 8lbs. to 10lbs. monthly, and be fit for market in about 12 weeks. An increase of 1lb. in flesh takes about 3lbs. or 4lbs. of peas, consequently a 20bush. crop should produce from 300lbs. to 400lbs. of meat. A flock pasturing on peas do not require much attention, and if provided with plenty of water and a little shelter the farmer should receive good returns without any risks.

*The Composition of Peas.*

	Water, per cent.	Albumi- noids.	Fats.	Carbohy- drates.	Fibre.	Ash.
Peas . . . . .	83.2	3.5	0.6	5.6	5.9	1.2
Hay . . . . .	16.7	14.3	2.6	34.2	25.2	7.0
Grain . . . . .	14.0	22.5	1.6	53.7	5.4	2.8
Meal . . . . .	13.5	23.4	2.0	51.0	7.0	3.1
Straw . . . . .	13.6	9.0	1.6	33.7	35.5	6.6
Silage . . . . .	50.0	5.9	1.6	26.0	13.0	3.5
Hulls . . . . .	12.0	7.3	1.2	31.9	44.7	2.9

**BLACKHEATH,**

October 21st.—Present: nine members.

**HATCHING AND FEEDING CHICKENS.**—Mr. J. Pym read a paper on this subject. The incubator, he said, should be stood on a perfectly level floor in a room of even temperature. Sound and fertile eggs, with smooth and even shells, should be selected, and when placed in the incubator the lamp should be so regulated that it would take from 12 to 16 hours to bring the temperature up to 103deg. Eggs intended for hatching in the incubator should not be more than a week old. After 24 hours the eggs should be turned regularly twice every day until the nineteenth day, after which they should be left alone until the hatch was over. If hens could not be induced to take the chicks and mother them, brooders heated by a lamp should be used. When hens were used for hatching, the clutch should be limited to 15 eggs, unless the birds were exceptionally large. Lining the nests with twigs of wormwood would help to keep insects and pests under control. The chicks would not require any food for about the first 18 hours after being hatched, when they should be given breadcrumbs or finely crushed grain. It was not advisable to give the young birds wet or moist food, as it had a tendency to cause diarrhoea. An excellent food consisted of crushed wheat mixed with finely cut green feed. A good supply of fresh and clean water in shallow drinking vessels was most essential. If the chickens contracted diarrhoea a mixture of finely crushed charcoal and dry bran and pollard would nearly always effect a cure. The report of the Congress delegates (Messrs. W. J. and H. G. Pym) was then received and discussed.

**CHERRY GARDENS (Annual average rainfall, 35.03in.).**

October 11th.—Present, 10 members.

**EARLY VERSUS LATE PLOUGHING.**—Mr. T. C. Stone, who read a paper dealing with the subject, said ploughing performed early in the season, when the land was dry and clean, was best for cereal crops in the hills districts, but if the soil was covered with a heavy growth of weeds, it would be advisable to turn in the rubbish so that the harrows and cultivator would not bring the rubbish to the surface when worked

immediately after the plough. For early ploughing in the orchard the speaker suggested working the land at a depth of from 4in. to 6in. On the hillsides and those places where the land became very wet, it was a good plan to plough a diagonal furrow to prevent the soil from washing away. It was also advisable to allow the land to remain in a rough condition during the wet weather, as that would help to prevent the soil from becoming water-logged. For the late ploughing or fallowing a good plan in that district was to break the soil up after the wet weather had finished, and work it at intervals during the summer, especially after rain, and when a good growth of weeds was showing. When late ploughing was being carried out in the orchard it might at times be found necessary to use a disc coulter, in order to turn the weeds under the soil. In the middle of the rows between the trees one could safely work at a depth of 6in., but the depth should be decreased when working close in to the trunks of the trees. The main advantages of late ploughing in the hills was that the land in most cases had become sufficiently dry so that it would not set into a solid mass. If the practice of late ploughing in the orchards was adopted in the hills much would be done to prevent the land from setting into a solid mass, and the maximum amount of moisture would be conserved.

#### LENSWOOD AND FOREST RANGE (Average annual rainfall, 35in to 36in.). October 17th.—Present: nine members.

The programme for the evening consisted of "Five Minute Speeches" by different members. The following gentlemen contributed to the success of the meeting:—Mr. H. H. Schultz, "Growing Swedes in the Young Orchard"; Mr. J. Green, "District Council Assessment of Orchard Lands"; Mr. J. Lawrence, "Double Swings versus the Solid Pull on Market Vans"; Mr. T. Hackett, "The Use of the Slasher in Clearing Land for the Plough"; Mr. G. Schultz, "Conservation of Moisture in the Soil"; Mr. R. Hale, "Hints to make Bureau Meetings more Interesting"; Mr. T. Lawson, "Tomato Culture."

#### MORPHETT VALE (Average annual rainfall, 23.32in.). October 24th.—Present: eight members.

CO-OPERATIVE SELLING OF MARKET GARDEN PRODUCE.—The Hon. Secretary (Mr. A. J. Furniss), who represented the Branch at the Annual Conference of Hills Branches, referred to the above subject, that had been brought forward at the gathering. The speaker spoke of the present unsatisfactory system as obtained in the Adelaide market. A good deal of time and labor was lost, which increased the cost of the produce to the consumer. He pointed out the difficulties that would have to be overcome if any co-operative venture was to be successful; but it was very hard to offer a solution of the problem. The disposal of fruit for export did not seem to present any insurmountable difficulties, yet the local disposal of the produce was a point that had not yet been properly solved. In the discussion that followed, members commented on the many co-operative ventures that had been instituted, and considered the lack of some management and the indifference of the employees to be two of the main factors in the failure of the organisations.

#### ROCKWOOD.

October 17th.—Present: 21 members and three visitors.


DEEP VERSUS SHALLOW PLOUGHING.—Mr. H. C. Hodgson, who contributed a short paper dealing with this subject, said from the experience that he had had in working the land in the Rockwood district he did not think deep ploughing could be recommended, because the top soil was very shallow. He was of the opinion that the land should be ploughed during May to a depth of 4½in. to 5in. The seed should be drilled in before any further rains had fallen on the fallow land, the harrows then put into operation, and the crop finally rolled when 3in. or 4in. high. In the discussion that followed Mr. A. Henley said he had always obtained the best results from shallow working of the soil. Mr. Steed agreed with the previous speaker, and considered the retentive nature of the soil was responsible

for the excessive moisture rather than the actual amount of rain that fell. Mr. A. Carter expressed a preference for shallow ploughing carried out during the summer months. Mr. H. Dunn spoke in favor of the tyne cultivator for working up the land, and thought harrowing should be left until as late in the season as possible, so that a hard crust would be prevented from forming on the surface of the soil. Messrs. B. Henley and Collett spoke in favor of shallow ploughing. Mr. F. Ness thought it was best to work a disc cultivator at a depth no greater than 5 in. Mr. J. H. Simmons and the Hon. Secretary (Mr. H. Diener) also spoke. Messrs. Collett and Bradford stated that they had found harrowing the crop very beneficial.

**BALHANNAH**, November 11th.—An interesting paper dealing with the subject, "Fruit Drying," was contributed by Mr. W. Miller. A good discussion followed. The matter, "Destruction of Noxious Weeds," was also brought before the meeting.

**CYGNET RIVER**, October 22nd.—The monthly meeting of the Branch was held at Mr. J. J. Osterstock's residence, when a paper, "What Effect would Prohibition have on Kangaroo Island" was read by Mr. A. C. Osterstock.

**SHOAL BAY**, October 18th.—The Hon. Secretary (Mr. Geo. Barratt) read the paper, "Farm Sanitation," that had been contributed to the Annual Congress by Lieut.-Col. Ramsay Smith, M.D., D.Sc., F.R.S. (Edin.), Permanent Head of the Department of Public Health of South Australia, and a lengthy discussion followed.



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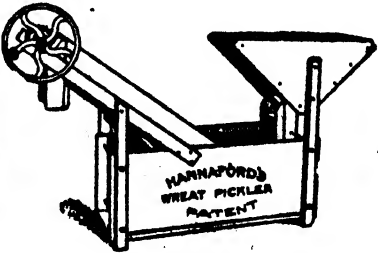
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## SOUTH-EAST DISTRICT.

NARACORTE (Average annual rainfall, 22.60in.).

September 10th.—Present: 15 members.

An interesting address, "My Experiences in Canada," was given by Rev. W. M. Corden. Mr. A. Johnstone read his monthly notes, "Work in the Garden and Orchard for September and October." Mr. J. J. Donoghue (Hon. Secretary of the South-Eastern Farms' Competition) brought several matters forward for discussion. Mr. E. S. Alcock (Superintendent of Experiments in the South-East) reported that Messrs. James, Johnstone, H. Thompson, and Smyth had decided to undertake the planting of plots of land with tobacco. The question, "Destruction of Noxious Weeds," was also brought before the meeting.

## TATIARA.

October 15th.—Present: 13 members and visitors.

**FALLOWING AND CULTIVATION.**—A paper on this subject was read by Mr. T. Hill. The speaker said the climatic conditions of their district made it necessary that fallowing should be commenced in July and finished not later than the end of September. New land, he thought, should be ploughed not less than 4in. deep, while soil that had carried crops could be worked an inch deeper, or according to the depth of the subsoil. A stump-jump plough, cutting not more than 8in. to the furrow, should be used. He had noticed that a plough that broke up more land than the width of the share did not do satisfactory work. The next operation was to work the harrows across the ploughing, to make a level surface soil. He also considered it advisable to work a tyne cultivator across the furrows, to break up any land that might have been missed by the plough. During the summer months the soil should not be touched, but if rain fell during January or February he suggested working a light cultivator at a depth of 3in. to destroy the summer weeds. If sufficient rain had fallen the grain should be sown in May, and the harrows finally run over the land. The speaker expressed a preference for using the combined drill and cultivator for seeding operations. The offices for the ensuing year were then elected, and the report of the delegates to the Annual Congress was received.

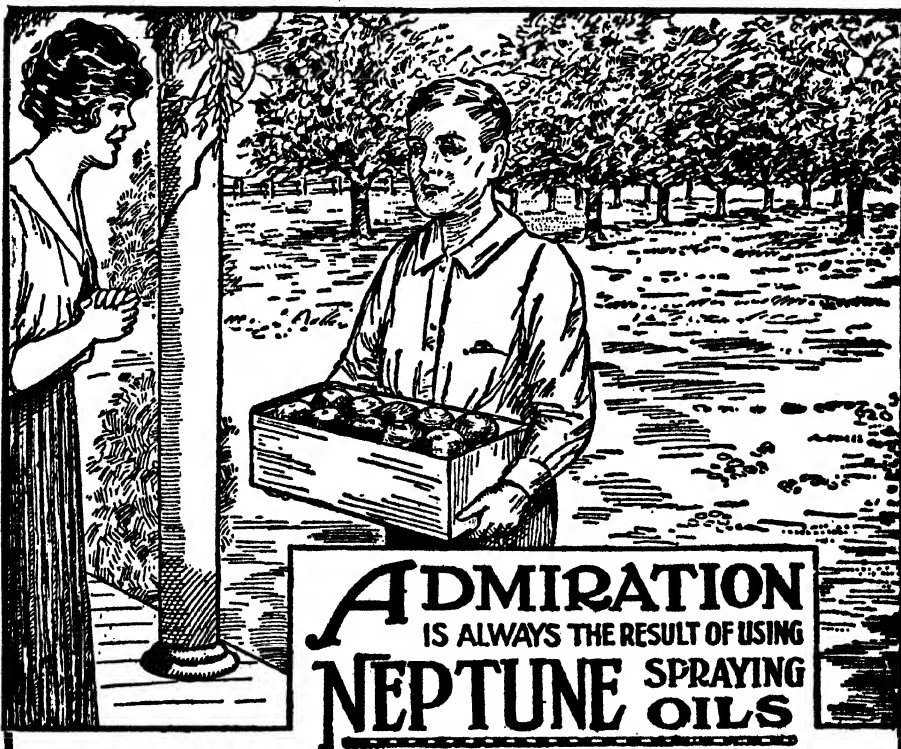
**FRANCES**, October 1st.—An interesting discussion took place on the subject "Take-all." Members were pleased to learn that the Department of Agriculture was taking steps, through the Professor of Botany at the Adelaide University, to see if something could be done to enlighten wheat growers concerning the disease.

**KONGORONG**, October 13th.—The monthly meeting of the Branch was held at Mr. W. A. Aslin's homestead. An interesting discussion arose from a statement by Mr. W. Aslin that he intended erecting an engine and small irrigation plant. The majority of members were of the opinion that if sufficient water could be obtained the project would prove a profitable undertaking.

**MOORAK**, October 13th.—Mr. C. Collins, who attended the Winter Course of Instruction at the Roseworthy Agricultural College, contributed a lengthy paper on his experiences. Mr. E. S. Alcock spoke on flax on the farm, and said he would like to see some of the members plant a small area, as the seed was very useful for feeding purposes, especially for calves. He also referred to the district exhibit at local shows.

**MOUNT GAMBIER**, October 8th.—An interesting afternoon was spent in receiving and discussing the report of the delegates to the Annual Congress (Messrs. D. A. Collins and W. Manser). Other matters brought before the meeting were "Flax-growing in the South-East" and "The Annual Departmental Tour of the South-Eastern Branches of the Agricultural Bureau."

**RENDELSHAM**, October 14th.—Mr. H. A. Stewart gave an interesting outline of the proceedings of the Annual Congress. An interesting discussion took place on the subject, "Compulsory Registration of Sires." Members were of the opinion that if rail freights on pure-bred live stock were reduced, breeders who lived considerable distances from the stud flocks and herds would be more likely to introduce pedigreed animals on to their properties.



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# THE JOURNAL

OF THE

## Department of Agriculture

### OF SOUTH AUSTRALIA.

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**All communications to be addressed:**

**"The Editor, Journal of Agriculture, Victoria Square, Adelaide."**

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T. PASCOE,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### **Agricultural Officers to Visit Eyre Peninsula.**

The Minister of Agriculture (Hon. T. Pascoe, M.L.C.) has announced that in response to requests received from a number of Branches of the Agricultural Bureau, he has instructed the Superintendent of Experimental Work (Mr. W. J. Spafford), the Secretary, Advisory Board of Agriculture (Mr. H. J. Finnis), and a veterinary officer of the Stock Department to visit Eyre Peninsula during the autumn. It is some while since a number of the Branches situated on the peninsula have been visited by officers of the Department of Agriculture. The Minister has expressed himself as being desirous that farmers in the outlying districts should be kept in touch with the work of the Department, and, as a consequence, the officers mentioned above will address meetings at a number of centres where Branches of the Bureau exist, and will also take the opportunity of opening new Branches in districts in which the settlers are desirous of establishing same.

### **"Journal," January, 1921.**

The Department's stock of the *Journal of Agriculture* for January, 1921, is exhausted. The Department of Agriculture will be grateful to any readers, who have no further use for this issue, if they will kindly post same to the Editor.

### **Imports and Exports of Fruits, Plants, Etc.**

During the month of November, 1921, 15,139bush. of bananas, 6 packages of bulbs, 124bush. of cucumbers, 3bush. of oranges, 48bush. of passion fruit, 6 packages of peanuts, 288bush. of pineapples, 30 packages of plants, 6,020 bags of potatoes, 58 packages of seeds, and 2,184 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910.

Under the Federal Commerce Act, 590 packages of citrus fruit, 4,328 packages of dried fruit, 1,200 packages of preserved fruit, and 253 packages of jam were exported to oversea markets. These were consigned as follows:—To London—3,968 packages of dried fruit, 1,200 packages of preserved fruit, 253 packages of jam; to New Zealand—590 packages of citrus fruit, 85 packages of dried fruit; to South Africa—190 packages of dried fruit; to China—85 packages of dried fruit.

Under the Federal Quarantine Act, 917 packages of seeds, &c., were examined and admitted from oversea sources.

## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"E. T.," Parana, reports colt, hollow eyed, will not eat, and walks very stiffly.

Reply—Give him a pint of raw linseed oil and enemas of warm soapy water. Follow the drench with a few doses of nux vomica, half an ounce of the tincture twice daily in half a pint of water. Try and tempt his appetite with small amounts of feed at a time. If he will eat give him light laxative food.

"C. J. L.," Owen, has four-year-old mare with a lump on the near side of the neck where the throat strap of the blinkers comes.

Reply—I think this will be the thyroid gland, which may be enlarged. Paint it daily with tincture of iodine. Try and adjust the throat strap so that it does not irritate the swelling. Examine the region in other horses and see if you can find a similar structure.

"G. H. F.," Parana, has heifer, when calved gave milk freely; subsequently one quarter appeared to choke and is now very hard to milk.

Reply—This is due to some obstruction in the teat canal, and may be of a temporary character. Milk it out carefully and thoroughly, and if it does not improve, the only hope of remedying it is to dilate the canal. If, however, the obstruction is in the upper part of the teat, there is some danger of inflammation, and it might be wiser not to interfere with it. Obstruction in the lower part of the teat can be treated with a teat dilator. This instrument can be obtained from the instrument maker. The pattern called the "Jersey" is a good one. Insert this in the teat several times so as to stretch the teat, and do this at intervals of two or three days. Three or four courses of this treatment should be sufficient. Boil the instrument for five minutes immediately before use.

Hon. Secretary Agricultural Bureau, Shoal Bay, reports lambs very short-winded, only able to walk a few steps. Legs stiff. Subsequently lambs are unable to rise. Death follows in about 10 days.

Reply—They are probably suffering from worm infestation. The owner should make a careful examination of the fourth stomach and small intestines of a lamb soon after death. Some of these worms are very minute and require careful examination to detect them. If at all numerous their effects on the health are serious. One of the most effective medicines for stomach and intestinal worms is copper sulphate (bluestone). This is used in a 1 per cent. solution, and the dose is 1½ozs. for lambs and 3ozs. for adult sheep. The solution is made by dissolving ½lb. of bluestone in a pint of boiling water. Cold water is added to this to make it up to 3galls. This quantity would be sufficient to dose 100 sheep or 200 lambs, allowing a little for waste. It should not be mixed in metal vessels. The dose may be repeated in a week or two.

"E. M.," Meribah, has staghound with weakness of the hindquarters and difficulty in rising.

Reply—This may be a sequel to distemper or it may be due to disease of the spinal cord. In any case the prospect of a cure is not favorable. Try Easton's syrup, 20 drops in a little water once a day. Keep him quiet and supply light easily-digested food.

"B. C. N.," Renmark, reports horse with a bruise on the near shoulder and a large swelling. This was lanced, but swelling again occurred.

Reply—This was quite correctly opened and the cavity drained out. The subsequent swelling was inflammatory in nature, and should subside with the application of warm disinfectant fomentations. You should remove the seton and discontinue the turpentine. If necessary enlarge the original opening—that is, if it is requisite to provide for the escape of discharge. Bathe daily with disinfectant solution, made by adding one tablespoonful of carbolic, izal, or kerol in a pint of lukewarm water. If the wound cavity has not filled up, syringe it out daily with the same solution.

"W. E. H.," Cooke's Plains, reports litter of pigs two months old, poor appetite and losing condition.

Reply—Oats with separated milk should be a suitable ration, but the oats should be crushed. It would be advisable to separate these pigs from the others. Put them on special feed, such as whole milk and oatmeal, for a little while. The trouble may be worms. You should look for evidence in the droppings. If you note any parasites give turpentine. The dose is one teaspoonful per 100lbs. body weight. Give on an empty stomach, repeat on three successive mornings. Do not drench them; they will take it in a little milk.

"A. P.," Mundalla, asks remedy for cow with sore teats.

Reply—Try the following application:—Tincture of iodine, 1 part; Friar's balsam, 3 parts; mix. Paint on after each milking with a camel hair brush.

"C. W. L.," Lameroo, reports horses in good condition, that are always rubbing themselves and stamping their feet.

Reply—They have a form of mange. I suggest that you treat them with lime sulphur wash, made by mixing  $\frac{1}{2}$ lb. sulphur, 1lb. quicklime, and 1gall. of water, and allowing this to simmer over a slow fire for two or three hours. Allow it to stand all night so as to settle the sediment, and pour off the clear yellow fluid into another vessel and dilute it with water so as to bring it up to 1gall., when it is ready for use. Apply the fluid with a swab to the parts affected. You will probably require three dressings at weekly intervals to effect a cure.

"G. E. B.," Cowell, reports draught horse, nine years, with an injury to the hind fetlock joint.

Reply—Put him in a small enclosure so that he can rest it as much as possible. Paint the joint with the following preparation:—Liniment of iodine, 4ozs.; Stockholm tar, 4ozs.; mix. Apply this with an old brush every two or three days. If the skin becomes tender increase the time between the applications. Do not allow the dressing to reach the hollow of the heel.

"J. G.," Tarcowie, has sheep with dry scabs around lips and muzzle.

Reply—The disease is contagious sore mouth; also known as lip and leg ulceration. Separate those affected. Remove the scabs; rub them off with a piece of stick, and dress the raw surface with the following ointment:—Cyllin, 3 drams; vaseline, 8ozs.; mix. Examine the coronets of those which are lame, and if found to be affected, dress with same preparation.

"H. L. W.," Murat Bay, reports cow, five years old, in milk seven months, giving milk tinged with a slimy, cloudy matter.

Reply—The change in the milk is due to an infection. Give her a dose of purgative medicine:—Epsom salts, 1lb.; treacle, 1 cupful; water, 1 quart. Follow this with two teaspoonfuls of formalin in a quart of water twice daily for two or three days.

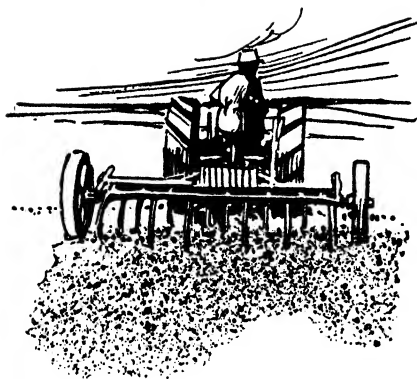
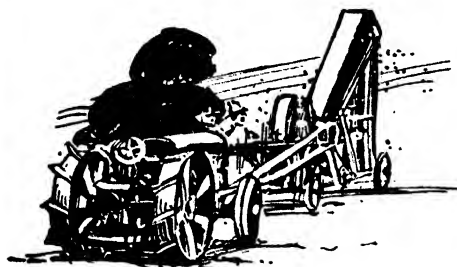
"G. H. W.," Hon. Secretary Agricultural Bureau, Tarcowie, reports mare affected with chronic scouring.

Reply—She requires careful feeding. Water her before feeding. Give her one tablespoonful of Fowler's solution of arsenic twice daily in the feed for a fortnight.

"A. E. R.," Minlaton, has foal, six weeks old, with swellings on the hocks, stifle, and front leg, and also discharge from the navel.

Reply—The foal has navel ill. Give him quinine sulphate, one flat teaspoonful twice a day mixed with a little treacle, and given on the tongue. Apply warm disinfectant fomentations to the affected joints two or three times daily. Use izal

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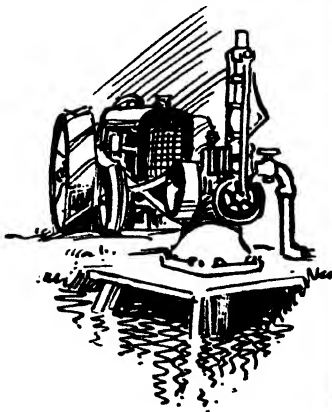
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or cyllin, 2ozs. to the gallon. This disease frequently causes permanent injury to the joints, which results in chronic lameness. The disease is due to infection through the navel, and can be prevented by providing a clean grass paddock for the mare to foal in; applying a ligature to the navel immediately after birth; and after removal of the cord below the ligature, painting with tincture of iodine daily until the stump shrivels up.

Hon. Secretary Agricultural Bureau, Winkie, asks—(1) Remedy for horse with large lump on shoulder; (2) treatment for bloating; (3) is it safe to place a cow on lucerne immediately after a drink; and (4) what time should elapse after depasturing on lucerne before it is safe to give a cow a drink.

Replies—(1) Lump on shoulder midway between mane and point. Before advising treatment I should be glad if you will inform me how long it has been present, whether it is increasing in size, and whether any heat or pain is present. (2) Treatment for bloating. The use of a gag in the mouth will remedy mild cases of hoven. This gag can be improvised by placing a short length of broom-handle in the mouth and fixing same to the horns. Medicinal treatment consists in the administration of any of the following:—(a) Aromatic spirits of ammonia, 2ozs.; turpentine, 2ozs.; water, 1 pint. (b) Permanganate of potash, 1 dram; water, 1 pint. (c) Turpentine, 2ozs.; carbolic acid, 1 dram; water, 2 pints. (d) Formalin, 2 drams; water, 1 pint. If nothing else is available, spirits (alcohol), half a pint in a pint of warm water is useful. If the bloating is very severe and the animal is so distressed that she opens her mouth to breathe, relief must be given by tapping the rumen (paunch) with a trochar and cannula, or failing this instrument, with a knife. Food should be withheld for 12 hours after an attack, or if it has been necessary to use the trochar or cannula it should be withheld for 24 hours. (3) and (4) Water in moderate quantities should not predispose a cow to bloat. Large quantities of cold water at any time may cause gas formation by disturbing rumination. I should say that half an hour before or after lucerne feeding would be safe.

Hon. Secretary Agricultural Bureau, New Sodbury, Yalata, asks for description of the symptoms of tetanus.

Reply—Stiffness of the muscles, particularly neck and back loins and jaw. Protrusion of the haw of the eye when the head is raised. Peculiar stiff and stilty gait. The breathing is shallow and the abdomen tucked up. The patient is easily excited, and in severe cases sweating is more or less marked. The mortality is about 70 per cent. The disease runs a course of from a few days to two or three weeks. Tetanus is a wound infection disease, and the shorter the period of incubation the more severe and fatal is the attack.

“C. T.,” Peake, reports saddle back with a sore back.

Reply—The facts suggest that the saddle is responsible for the trouble, and you will continue to have a recurrence of sore back until it is attended to. The actual treatment of the sore consists merely in keeping it clean and applying some healing dressing, such as zinc ointment daily.

“W. E. A.,” Solomontown, reports cow carrying a dead calf in the womb.

Reply—Remove the remains of the dead calf and douche her out with a solution of permanganate of potash. The calf will have to be removed piecemeal, and putrefaction will be so far advanced that there should not be much difficulty in separating the parts. The use of a sharp penknife may be necessary, but only to cut the skin. Afterwards explore the womb and make sure that the cavity has been completely evacuated. Douche out with lukewarm permanganate of potash solution. Use one flat teaspoonful to a kerosine-tin of water. Inject this with a piece of rubber tubing or  $\frac{1}{2}$  in. garden hose about 3ft. long, and a tin funnel. Continue the injection of fluid until what flows away is about the same color as that going in. Then lower the funnel to syphon out what is still in the womb. Douche once daily. She may require a stimulant after the removal of the dead calf. Give her half a tumbler of spirits in a pint of warm water.

“Mrs. W.,” Coonawarra, reports cow gave birth to twin calves two months ago. Fortnight after calving very weak on legs, and has a habit of stretching her neck. Eyes have a dull appearance.

Reply—You should supply her with a liberal allowance of sound wholesome food. A well-balanced ration is the important factor. See that she is provided

with common salt. You can give her 2ozs. daily of salt and sweet bonemeal in her feed, and nux vomica, one tablespoonful twice daily in a pint of water. Give the latter for a week. The milk is fit for use.

"R. M. R.," Mootatunga, has two-year-old colt with a hard swelling under the jaw.

Reply—If the swelling is not warm or painful do not interfere with it for the present, but write again in a few weeks regarding it. If, however, there is heat or pain present, you may expect further abscess formation. In this case apply hot fomenta or a little blister, and as soon as the abscess points it should be opened with a clean sharp knife and the wound kept clean and dressed with disinfectant solution.

"R. K.," Melrose, has mare, six years old, with a swelling at top of shoulders.

Reply—It would appear to be due to some injury, probably from the collar, which you should carefully examine to see that it fits her properly. Continue the use of fomenta and keep her out of work until the swelling subsides.

"S. B. B.," Mallala, reports yearling pony which is affected with night blindness.

Reply—This may be due to weakness or debility, or may be caused by an alteration in the internal structures of the eye. All you can do is to improve the general health by nutritious diet and tonic treatment. Give the following powders:—Carbonate of iron, 1½ozs.; powdered nux vomica, 1oz.; mix. Divide into 24 powders. Give one twice daily in the feed or mixed with a little treacle and given on the tongue.

"H. R.," Cowell, reports bull strains heavily when passing dung. Testicles are drawn right up into the body, and the animal has a "tucked up" appearance and lies down as if in pain.

Reply—I advise you to give him a pint and a half of raw linseed oil. Put him on light laxative diet, mashies, bran and linseed, also green stuff if the latter can be procured. Give a tablespoonful of bicarbonate of soda twice daily. This can be given in the drinking water. Give him rain water to drink.

"F. G. H.," Clare, reports cow swollen as though "blown," froths at the mouth, lies down with head stretched out.

Reply—Give a level teaspoonful of powdered nux vomica twice daily. Mix this with a little treacle and give it on the tongue. Feed generously. Give 1oz. each of salt and sweet bonemeal twice daily in the feed.

"R. A. W.," Coomandook, has horse with boils on the shoulder.

Reply—Apply the following lotion morning and evening:—Sulphate of zinc, 1oz.; acetate of lead, 1oz.; water, 1 quart; mix. Shake the bottle before pouring out.

"W. G. L.," Carawa, has filly foal with a swelling at the navel.

Reply—This swelling is a navel rupture. The simplest form of treatment is the application of an irritant which produces a local inflammation and fills up the hernial opening. For this purpose use a little red blister made of 1 part red iodine of mercury to 8 of lard. Apply this over the swelling, rubbing in well for five minutes. If it does not respond to this treatment it will require a surgical operation. Small ruptures in this region may disappear spontaneously during the first year of life, and in any case it will not, unless it becomes much larger, seriously affect the filly for work, though it will affect her value for sale.

"N. S.," Jamestown, reports heifer with an extensive ulceration of the teat.

Reply—I advise you not to allow the calf to suckle her. It will probably be necessary to milk the teat with a teat tube. Boil the tube for a few minutes in water with a little washing soda each time before using and carefully cleanse the teat with a little disinfectant solution before inserting the tube. This is necessary on account of the danger of infecting the quarter and so causing an attack of mammitis. Always milk out the three other teats before handling the sore one. Apply to the sore teat with a camel-hair brush after each milking the following mixture:—Tincture of iodine, 1 part; Friar's balsam, 3 parts; mix. If the case is carefully treated it should respond satisfactorily, in which case you need not consider fattening her for the butcher.

## THE RISE AND PROGRESS OF THE SOUTH AUSTRALIAN FRUIT-GROWING AREAS ON THE RIVER MURRAY.

[Address delivered before the South Australian Nurserymen and Seedsmen's Association by ARTHUR J. PERKINS, Director of Agriculture.]

I have been asked by your Association to give a brief sketch of the rise and development of our River Murray Fruit-growing Settlements. And whilst I cannot claim to have been present at their birth, as has been suggested by your President, I reached Australia five years later, and have kept more or less in touch with them for close on 30 years since. I am afraid that in handling this subject I shall have to deal very largely with figures and statistical data, and trust that your natural business interest in these areas will help to maintain your interest in what I shall have to say.

The Murray Irrigation Areas were opened in 1887—the year of Queen Victoria's Jubilee—by Messrs. Chaffey Bros., who came to us from California with a high reputation as irrigation experts. They had built up the Ontario Irrigation Settlement, which, although started only in 1882, was carrying 2,500 settlers five years later in 1887. What they had done in California they hoped to repeat here—in Victoria and South Australia—and, as they thought at the time, with even greater prospects of success. They believed the Australian technical factors—climate, soil, water—to be superior for their purposes to those of California. It is probable, however, that they overlooked the enormous economic advantage enjoyed by California in the shape of a huge home market for products raised on its irrigation settlements. And if Australian settlements have not on the whole progressed as rapidly as those of the United States, it is mainly because of unavoidable market difficulties and relatively scanty population. This continues to-day the most serious problem before these settlements, and I propose making further reference to it later on.

Under special conditions, into the details of which it is unnecessary to go, Messrs. Chaffey Bros. secured the concession of 250,000 acres in Victoria and an equal area in South Australia, in the centres of which they laid the foundations of the settlements of Mildura and Renmark respectively. When, from the standpoint of 34 years' experience, we look at the results that have been achieved, we realise that it would have been difficult to have made more happy selections for the growth and production of dried and citrus fruit. This fact alone is an abiding tribute to the genius of the three brothers, who not only blazed the way for us, but who laid the foundations truly and well of one of the finest assets we have in these States. It is easy enough to-day to determine where and how irrigated fruit-growing can be practised to best advantage in the State, but the position was otherwise difficult 34 years ago. The river was there, it is true, but who was to say that these wastes of mallee and box and pine were eventually to carry flourishing orchards and vineyards and a prosperous population? Chaffey Bros. not only believed that this



would be so, but they staked their reputation on this belief, and sank large sums of money into this apparently valueless land in support of it.

Unfortunately, Chaffey Bros. met the fate of most pioneers. From the purely personal point of view they were not successful, and after eight years of strenuous labor and disappointments, were forced into liquidation in 1895. These brothers were so intimately connected with these Irrigation Settlements that I may be pardoned a brief digression on their behalf. Democracies are proverbially fickle and forgetful; we remember that they failed financially, but we are apt to forget the gallant fight they put up against overwhelming odds, and the inestimable boon (notwithstanding their personal failure) they succeeded in conferring upon us and our successors. The early nineties was a period of very pronounced financial depression; unemployment was general, credit difficult to secure, enterprise dead; and it is against these difficulties that Chaffey Bros. had to battle single-handed, coupled with the lack of markets and the general inefficiency and inexperience of early settlers who were unable to see what prospects were ahead of them, and proportionally critical and restive. Hard things were said of Chaffey Bros. in their later years, and yet if there are any in our midst who deserve well of the Commonwealth, it is these men, and perhaps some day we or our successors will realise it and do them tardy honor in appropriate fashion.

It is probable that Chaffey Bros. over-estimated the area of land available for irrigation purposes on the River Murray. In their earlier advertisements of the infant settlements they stated freely that 500,000 acres (including Mildura) were available for irrigation farms. Their original Renmark block extended from the New South Wales border, including the present Chaffey Irrigation Area, but did not come west of Berri, nor did it include it. It extended about 18 to 20 miles north of the river and covered, as has been stated, 250,000 acres, only portion of which, however, is irrigable according to present-day ideas.

By the courtesy of the Irrigation Department I am able to supply a statement of the total irrigable areas supposed to be adapted to fruit and wine growing on the South Australian portion of the River Murray.

*Table I.—Showing Irrigable Area on River Murray supposed to be Suited to Fruit and Vine Growing.*

	Acres.
Chaffey Irrigation Area . . . . .	50,000 to 100,000
Renmark . . . . .	13,348
Lyrup . . . . .	556
Berri . . . . .	8,100
Pyap . . . . .	1,000
Moorook . . . . .	1,028
Cobdogla . . . . .	30,000
Kingston . . . . .	493
Holder . . . . .	358
Waikerie and Ramco . . . . .	3,559
Cadell . . . . .	1,184
New Era . . . . .	1,208

Total . . . . . 110,734 to 160,734

*High Irrigable Land on Lower Murray.*

Wall .. . . .	160
Mypolonga .. . . .	1,074
Swanport .. . . .	88
Neeta .. . . .	410
Pompoota .. . . .	193
Jervois .. . . .	290
Wood's Point .. . . .	250
Total .. . . .	2,465
Grand total .. . . .	113,199 to 163,199

Thus it would appear that there is not much more than 164,000 acres of land available for fruit and vine growing on the South Australian course of the river; but even this limited area, how great an asset it is likely to prove to the State, I shall endeavor to show later on.

The establishment of vineyards and orchards is a process involving time; immediate returns, such as are given by annual crops, cannot be expected. Hence, important financial difficulties which have to be faced in any new settlement until the planted areas come into bearing; and these difficulties were not wanting at Mildura and Renmark with those whose original capital was mostly inadequate. Fortunately, the fierce heat of these districts, coupled with abundant water, induces more rapid development than is usual elsewhere, and both trees and vines come into bearing correspondingly earlier. Nevertheless, difficulties of this kind handicapped early settlers and complicated matters for Chaffey Bros. The general progress of the settlements can in a measure be gauged by the areas brought from year to year under vine and fruit trees. This has been summarised in Table II. :—

*Table II.—Showing Gradual Development of Areas under Vines and Fruit Trees in Murray Irrigation Areas.*

	Orchards. Acres.	Vineyards. Acres.	Orchards and Vineyards. Acres.	Increase. Acres.
1889-90 .. . . .	61	27	88	—
1890-1 .. . . .	89	198	287	99
1891-2 .. . . .	196	324	520	233
1892-3 .. . . .	459	494	953	433
1896-7 .. . . .	790	494	1,284	331
1897-8 .. . . .	882	476	1,358	94
1898-9 .. . . .	1,592	517	2,109	751
1899-1900 .. . . .	1,589	523	2,112	3
1900-01 .. . . .	1,659	700	2,359	247
1901-02 .. . . .	1,446	866	2,312	— 47
1902-03 .. . . .	1,126	1,193	2,319	7
1903-04 .. . . .	1,397	1,404	2,801	482
1904-05 .. . . .	808	1,717	2,585	— 216
1905-06 .. . . .	850	1,777	2,627	42
1906-07 .. . . .	765	2,043	2,808	181
1907-08 .. . . .	1,097	2,778	3,875	1,067
1908-09 .. . . .	1,095	3,184	4,279	404
1909-10 .. . . .	1,207	3,178	4,385	106
1910-11 .. . . .	1,310	3,298	4,608	223
1911-12 .. . . .	1,641	3,521	5,162	554
1912-13 .. . . .	1,986	3,751	5,737	575

*Table II.—Showing Gradual Development of Areas, &c.—continued.*

	Orchards.	Vineyards.	Orchards and Vineyards.	Increase.
	Acres.	Acres.	Acres.	Acres.
1913-14 . . . . .	2,101	4,044	6,145	408
1914-15 . . . . .	2,707	4,510	7,217	1,072
1915-16 . . . . .	3,535	5,272	8,807	1,590
1916-17 . . . . .	4,361	5,676	10,037	1,230
1917-18 . . . . .	4,794	5,968	10,762	725
1918-19 . . . . .	4,969	6,517	11,486	724
1919-20 . . . . .	5,307	7,558	12,865	1,379

This table is as complete as statistical data will permit of, and, in a sense, it reflects the ups and downs of these River Settlements. In the early nineties, progress, although relatively slow, was fairly consistent from year to year, and vineyards and orchards at first ran on approximately parallel lines.

Towards 1894, a new element was introduced on the river in the shape of what came to be known as "village settlements." We were in the midst of a period of great financial depression, and unemployment was rife throughout the State. The Government of the day thought to find a solution of these difficulties in land settlement on communistic principles. Consciously or unconsciously, men were very largely at the time more or less influenced by the Georgian theories, which pointed to the soil as the source of all wealth and to which individual man was supposed to have an imprescriptible right. It was tacitly or openly assumed that it was only necessary to give man access to the soil to enable him to eke out an honorable living. Moreover, it was recognised that the aggregation of units invariably tends to create value in land, and it was urged that this "unearned increment" should belong to the community and not to the individual. It was theoretical views such as these that led to the establishment of Communistic settlements on the banks of the river. It was an experiment generously conceived, but doomed to failure from the outset. One by one the settlements closed and communal land gradually reverted to individual ownership. Among the causes of failure may be quoted—Utter inexperience of rural work and occupation of the majority of settlers; lack, and, in most cases, complete absence of capital; general individual unfitness for rural work; tendency of local politics to take precedence of local work, &c.

Nevertheless, in the history of the river, these settlements were not without value. They helped to explore the river banks and to determine what portions of them were adapted to closer settlement. All but three we know to-day as flourishing irrigation settlements run on the usual individualistic lines, namely, Lyrup, Pyap, Moorook, Kingston, Holder, Waikerie, Ramco, and New Era.

The influence of these settlements on the River Irrigation Areas was soon felt. Whereas in 1893 practically the whole area under fruit trees and vines (953 acres) was concentrated in Renmark, in 1896-7 we find Renmark with 971 acres and the rest of the river with 313 acres; in 1897-8 the figures were 950 and 408 respectively, &c. To-day, Renmark, the pioneer irrigation settlement, has 4,388 acres under vines and fruit trees, as against 8,477 acres for the rest of the river.

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With the advent of Federation in 1900, the River Settlements carried 1,659 acres of orchard and 700 acres of vines. Towards that period the salt question and seepage from leaky channels, always more or less present in the past, began to assume alarming proportions. Trees, too, had been planted on uncongenial soils; unmarketable types of trees, or types ill-adapted to local conditions, had been planted; these and other causes led to a gradually progressive reduction of the orchard area between 1900 and 1907. This phenomenon was far more pronounced over the older settlement of Renmark than over the more recent arrivals. Concurrently with the reduction of the orchard area, vineyards began to expand rapidly, and between 1900 (700 acres) and 1907 (2,043 acres) the area under vines was almost trebled. This period witnessed the coming into favor of the currant and Sultana vines. The difficulty of getting them to bear regularly was gradually being overcome, and to-day they undoubtedly represent one of the main items in river prosperity.

Thereafter, to the opening of war, progress was steady, if somewhat slow. In 1914 we find 2,707 acres under orchard and 4,510 under vines, or a combined total of 6,145 acres, close on treble the area noted at the opening of Federation.

Meanwhile, marketing difficulties were beginning to be felt; local demand for dried fruit was gradually being overhauled; what was to be done with the surplus? It is common knowledge that even a small surplus is very dangerous on a free market, and, without some sort of agreement among growers, unprofitable prices would probably have ruled the market and led possibly to the collapse of the settlements. Fortunately, the interstate demand for strong spirit was very good at the time, and distillers soon came to the rescue and relieved growers of any inconvenient surplus. Incidentally, the establishment of distilleries on the river has given rise to extensive plantations of Doradillo vines grown expressly for distillation purposes.

Since the war, down to 1919-20, expansion has been very rapid; the combined area under fruit trees (5,307 acres) and vines (7,558 acres) has practically doubled in a period of six years. The settlement of discharged soldiers on irrigated areas has undoubtedly had much to do towards accelerating the normal rate of expansion.

In this connection it is of interest to compare the relationship between the river combined vineyard and orchard area and that of the whole State. This comparison has been made in Table III.:

*Table III.—Quinquennial Comparison of River Vineyard and Orchard Areas with those of the State as a Whole.*

	Orchard Area.			Vineyard Area.			Orchard and Vineyard Area.		
	River.	State.	%	River.	State.	%	River.	State.	%
1891-2 . . .	196	8,928	2.2	324	12,314	2.6	520	21,242	2.4
1896-7 . . .	790	11,747	6.7	494	18,333	2.7	1,284	30,080	4.3
1900-1 . . .	1,659	16,001	10.4	700	20,158	3.5	2,359	36,159	6.5
1905-6 . . .	850	19,320	4.4	1,777	23,603	7.5	2,627	42,923	6.1
1910-11 . . .	1,310	22,410	5.9	3,298	22,952	14.4	4,608	45,362	10.2
1915-16 . . .	3,535	25,576	13.8	5,272	27,764	19.0	8,807	53,340	16.5
1919-20 . . .	5,307	30,617	17.3	7,558	32,784	23.1	12,865	63,401	20.3

From the progressive rise in the percentage columns, it is easy to see that both vineyard and orchard areas have expanded more rapidly on the river than in other portions of the State. To-day over 17 per cent. of our orchards and over 23 per cent. of our vineyards, representing in combination over one-fifth of State orchards and vineyards, are situated on the banks of the Murray. Surely this is a feat which we owe originally to the enterprise of Chaffey Bros., and of which they would have been very proud had they continued at the helm in the pioneer settlement.

Now let us turn to a point which must interest you, as nurserymen, namely, the proportions of different fruit trees grown on the river. These have been summarised below in Table IV.:

*Table IV.—Comparison of Trees Grown on the River and in the State as a Whole (1919-20).*

	River. Acres.	State. Acres.	Percentage.
Vineyards . . . . .	7,558	32,784	23.05
Orchards . . . . .	5,307	30,617	17.33
	Trees.	Trees.	
Oranges . . . . .	174,478	397,685	43.87
Peaches . . . . .	105,918	332,165	31.89
Apricots . . . . .	87,720	312,031	28.92
Pears . . . . .	58,778	245,701	23.92
Almonds . . . . .	21,721	247,399	8.78
Apples . . . . .	13,184	1,035,294	1.27
Plums and Prunes . . . . .	13,129	231,623	5.67
Lemons . . . . .	5,354	33,938	15.78
Figs . . . . .	2,896	29,729	9.74
Olives . . . . .	2,773	34,260	8.09
Quinces . . . . .	1,416	30,323	4.65
Other Citrus . . . . .	831	1,713	48.51
Cherries . . . . .	734	41,214	1.77
Nuts . . . . .	462	9,044	5.11

It will be noted that orange trees occupy pride of place in the matter of number of trees grown along the river, representing close on 44 per cent. of those grown in the whole State. They are followed by peaches, 32 per cent.; apricots, 28 per cent.; and pears, 24 per cent. These four types of trees would appear best adapted to present economic conditions of the river. It is possible, of course, that in the course of time other trees, such as prunes, olives, lemons, almonds, figs, &c., may receive greater attention on the river, than is at present the case, whilst others possibly may decline somewhat in popularity.

Let us now turn to the fruit output of these River Settlements and see how it compares with that of the rest of the State. The position has been summarised in Table V.

Table V.—1919-20 Fruit Output of River Settlements and State Compared.

	River Settlements.	State.	Percentage.
Fresh Fruit—	Cwts.	Cwts.	
Almonds . . . . .	564	5,853	9.3
Olives . . . . .	503	5,929	10.0
Nuts . . . . .	3	609	0.05
	Bush.	Bush.	
Apricots . . . . .	77,481	176,316	43.9
Peaches . . . . .	75,328	194,842	38.7
Oranges . . . . .	61,759	238,918	25.9
Pears . . . . .	43,739	139,625	31.3
Apples . . . . .	4,885	445,916	1.1
Plums and Prunes . . . . .	2,850	136,053	2.1
Lemons . . . . .	2,287	48,743	4.7
Quinces . . . . .	715	41,893	1.7
Figs . . . . .	650	14,555	4.5
Other Citrus . . . . .	295	1,160	25.4
Cherries . . . . .	59	54,214	0.01
	Tons.	Tons.	
Grapes . . . . .	21,630	56,558	38.2
Dried Fruit—	Cwts.	Cwts.	
Raisins . . . . .	57,619	58,502	98.5
Currants . . . . .	31,003	80,400	38.5
Peaches . . . . .	6,580	7,443	88.4
Apricots . . . . .	5,437	5,851	92.9
Pears . . . . .	2,707	3,242	83.5
Prunes . . . . .	106	3,423	3.1
Apples . . . . .	20	1,085	1.9
	Galls.	Galls.	
Wine . . . . .	910,661	5,085,939	17.9

The salient features of Table V. are that (1) practically all raisins, dried apricots, peaches, and pears raised in the State come from the Murray Settlements; (2) that these settlements are responsible for 44 per cent. of our apricots, 39 per cent. of our peaches, 31 per cent. of our pears, and 26 per cent. of our oranges; and (3) that they produce, in addition, 38 per cent. of the grapes grown and 18 per cent. of the wine made in the State to-day. I take it that these results are highly creditable to a relatively small area of the State which 35 years ago was reckoned to be of little or no economic value.

Finally, is it possible to assess in £ s. d. the present value to the State of the River Murray Fruit Settlements? I have endeavored to assess these values in Table VI. on the basis of 1919-20 current prices.

Table VI.—Showing Gross Values of River Murray Fruit and Vine Production at 1919-20 Current Prices.

	Quantities.	Unit Values.	Total Values.
Dried Fruit—	Cwts.	£ s. d.	£
Raisins . . . . .	57,619	3 15 0	216,071
Currants . . . . .	31,003	3 5 4	101,277
Apricots . . . . .	5,437	6 10 8	35,522
Peaches . . . . .	6,580	5 2 0	33,558
Pears . . . . .	2,707	5 2 0	13,806
Prunes . . . . .	106	6 10 8	693
Apples . . . . .	20	4 4 0	84

*Table VI.—Showing Gross Values of River Murray Fruit, &c.—continued.*

	Quantities.	Unit	Total
	Bush.	Values.	Values.
Fresh Fruit—			£
Oranges . . . . .	61,759	0 8 0	24,704
Pears . . . . .	9,629	0 6 0	2,889
Apples . . . . .	4,661	0 6 0	1,398
Lemons . . . . .	2,287	0 7 6	858
Plums . . . . .	1,960	0 7 0	686
Apricots . . . . .	1,363	0 9 6	647
Figs . . . . .	650	0 9 6	309
	Cwts.		
Almonds . . . . .	564	5 3 0	2,905
Olives . . . . .	503	2 0 0	1,006
Miscellaneous—	Galls.		
Wine . . . . .	910,661	0 3 2	144,188
Total . . . . .			<u>£580,879</u>

We see, therefore, that 12,865 acres of vines and fruit trees yielded in 1919-20 a gross revenue of £580,879, or, on the whole area, over £45 per acre. It must not be forgotten, however, that a large portion of this area—about 3,555 acres—has not yet reached the bearing stage. If, therefore, as is reasonable, we refer the gross revenue to the area actually responsible for its production—9,310 acres—we shall note the very satisfactory gross return of £62 7s. 10d. per acre. It is permissible to assume, therefore, that, granting adequate marketing facilities, these River Settlements will in the near future be contributing several million sterling to the general agricultural revenue of the State.

The relative value of these vine and fruit settlements to the State may be stressed in a final contrasting statement. The Government Statist has estimated our general crop revenue for 1919-20 to have amounted to £13,728,224; it was secured from 4,467,696 acres (including 1,408,926 acres of bare fallow). This represents a mean return of £3 1s. 5d. per acre. On the other hand, 9,310 acres, which, after deduction of vines and fruit trees not in bearing, represents only 0.21 per cent. of the total area from which our crop revenue was derived, yielded £580,879, or 4.23 per cent. of that revenue. It follows, therefore, that from the point of view of production, one acre on the Murray which 35 years ago was of little or no economic value, is to-day worth 20 times more than our average crop-producing land.

Much imagination is not needed to form a definite picture of the future prospects of the Murray Valley. If to the vine and fruit settlements of the Upper River we add the as yet barely skimmed wealth of its lower reaches, it is no exaggeration to anticipate that in no distant future the Murray Valley will carry a population equal to the present State population and yield an agricultural revenue equal to the present State revenue.



We cannot, however, close our eyes to the fact that there is one major difficulty looming ahead of us. It may delay the brilliant future which we anticipate and involve existing settlers in temporary difficulties; it cannot, however, permanently check the progress of these settlements. I am referring now to the difficulty of disposing satisfactorily of the enormous produce which will soon come pouring in from the newly planted areas. The difficulties which are confronting us to-day were present in the minds of the far-seeing founders of Mildura and Renmark. Listen to what Mr. George Chaffey says, as reported by an *Argus* of 1887:—"The market is the last thing to trouble any man who has gone deep into the matter. I have told you (your own Customs returns told me) that you import now £750,000 worth of various fruits in the year. With the natural increase in population and the education of taste afforded by good and cheap commodities, you will double that quantity in 10 years, though I can hardly hope that we alone shall be able to supply you with such an amount in 10 or 100 years. A million and a half a year is a bigger contract that we ever reckoned on. But take others into the reckoning. Suppose you go in as big as California, is not the world open to you? There are a million and a half acres of vineyards and fruit gardens in California now, and fruit is a better price than when the first acre was watered. I expect to see a million and a half acres tilled on the Murray before I die, and have not the slightest doubt about the market. There may be a glut—a glut almost always precedes the opening of the best market for any produce—but there is no doubt whatever about the sufficient opening being found when it is properly sought. . . . Your market is the world, and when the world is glutted you may stop your taps and hoes, but not before."

Well, as has been stated, Chaffey Bros. probably over-estimated the area of irrigable land on the Murray; they also did not make sufficient allowance for the population factor. Nevertheless, they believed that we could market our dried fruits in competition with other peoples of the world. Personally, I have had my periods of doubt over this question, but when I have reflected that California, a country of high wages and high standards of living, has been able to do so, then I have felt satisfied that what California has been able to do, we too shall be able to do, so soon as we set out minds to it. Nevertheless, the glut will come—the bitter hour before the dawn—and in view of the magnitude of the interests involved, true statesmanship will endeavor to circumvent it, and leave no stone unturned in the immediate search for foreign outlets and markets. Personally, I have no fear for the future of the Murray whatever our supineness, but if early action is taken much individual suffering and loss will be avoided, and it is quite possible that the inevitable glut may, after all, never materialise.

## REPORT ON FIRST YEAR OF OPERATIONS OF THE RIVER MURRAY HERD TESTING ASSOCIATION.

OCTOBER 1ST, 1920, TO SEPTEMBER 30TH, 1921.

[By ARTHUR J. PERKINS, Director of Agriculture.]

The first year of operations of the River Murray Herd Testing Association came to a close on September 30th, 1921, and since this represents the first South Australian attempt in this direction, and it is believed that the establishment of similar associations in other centres of the State would do much towards raising the standard of local production, it is thought advisable to submit the results to close and critical examination.

### PEDIGREE HERD TESTING AND DAIRY HERD TESTING CONTRASTED.

It is probable that results secured at Murray Bridge will be contrasted with those secured elsewhere, and perhaps under totally different conditions. Hence it is necessary to point out that between ordinary pedigree herd testing and dairy herd testing there are very essential differences, and that results obtained under the one are not necessarily comparable with those obtained under the other. In the former case, the only object in view is the discovery of meritorious dams, whose qualities it is assumed will, in varying degree, be transmitted to their progeny whether male or female. In dairy herd testing, on the other hand, attention is mainly concentrated on total output in the whole herd, represented in final analysis by a high individual output per cow over a period of 12 months. In the one case, therefore, herd testing is a purely technical operation, leading indirectly to enhanced commercial returns in improved sales of young breeding animals whose milking ancestry can be shown to be satisfactory; whilst in the other, the commercial results aimed at, in the shape of increased sales of milk or cream, are direct. Nevertheless, since all his cows are under test, the dairyman who is a member of a Herd Testing Association reaps some of the benefits of pedigree herd testing. In this direction it is assumed that he will replenish his herd with heifers from his most satisfactory milkers, and discard those from dams whose returns have proved less satisfactory.

These facts lead to differences in procedure which cannot be avoided. Pedigree herd testing is interested solely in milk returns from single lactation periods. Dairy herd testing is interested in total milk output over 12 calendar months, and as such will often include incomplete lactation periods, and in individual cases one complete lactation period plus a fraction of another. It follows, therefore, that the mean outputs of a Herd Testing Association are not strictly comparable with the results usually given for pedigree herds, and having exclusive reference to single lactation periods.

**SUMMARY OF RULES UNDER WHICH THE TESTS HAVE BEEN CONDUCTED.**

1. Every cow past her first calf in possession of a member of the Association is registered, and so long as she continues in his possession, whether in milk or dry, whether in health or in sickness, she is taken into account in determining the mean output per cow of the herd. Thus, suppose a dairyman to have 10 registered cows, but only eight in milk, yielding a monthly total of 620galls., the mean yield for the month would be 62galls.

2. Should a member decide to fatten and sell a registered cow which has proved unsatisfactory, on notification to the Association's Recorder he is given one month's grace to do so; this period may be extended to three months on good cause being shown.

3. Members weigh morning's and evening's milk of each cow at least once a week.

4. The Recorder, who is a paid servant of the Association, weighs morning's and evening's milk of each cow in the Association once a month, and determines its percentage of butter fat.

5. Milk drawn six weeks prior to calving and four days after calving is not credited to cows concerned; and in one calendar year one cow is never credited with more than 319 days' milk.

6. The Recorder forwards each month to the Department of Agriculture all the above results, together with full details concerning individual herds, including feeding methods, calvings, sales, deaths, etc. It is upon these data that the final results are determined.

**MEAN 1920-21 OUTPUT OF ALL HERDS COMPRISED IN THE ASSOCIATION.**

Both the number of herds and the number of cows in each herd have varied from time to time during the course of the year. Between October 1st, 1920, and September 30th, 1921, the Association consisted of 18 herds. Of these, however, 13 only were continuously under test for the full period of 12 months, the remaining five being connected with the Association for fractions of the year only. Similarly in the 13 continuously tested herds, not all registered cows were present in the herds for the full period of 12 months. From time to time some were sold, some died; others again were purchased, whilst heifers coming in on their first calves were equivalent to new cows. All these variations have had to be taken into consideration in the final calculations. In this connection the variations in the continuously tested herds may be set out as follows:—

Present, 1/10/20 . . .	246 head	
Purchases . . . . .	24 head	
Heifers on first calf .	22 head	
Sales . . . . .		33 head
Deaths . . . . .		2 head
<hr/>		
Total . . . . .	292 head	
Less reductions .	35 head	
<hr/>		

Present, 30/9/21 . . . 257 head

Eighteen cows calved twice between October 1st, 1920, and September 30th, 1921. Complete details concerning the combined aggregate output of all the herds in the Association have been summarised in Table I.

TABLE I.—*Statement Showing Total Production by River Murray Herd Testing Association, 12 Months ended September 30th, 1921.*

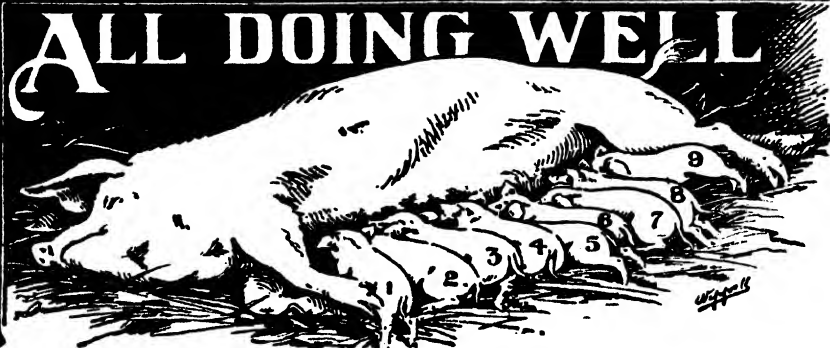
Month.	Average Cows Under Test.	Average Cows in Milk.	Average Butter-fat Test.	Milk.		Butterfat.	
				Produced by Society.	Per Cow.	Produced by Society.	Per Cow.
1920-21.	Cows.	Cows.	Per cent.	Lbs.	Lbs.	Lbs.	Lbs.
October ...	246-00	203-93	4-10	157,255-5	639-25	6,442-97	26-19
November..	267-26	227-26	4-00	160,388-5	600-12	6,408-27	23-98
December .	333-58	286-39	4-12	198,866-5	596-16	8,196-15	24-57
January ...	336-32	291-93	4-16	201,283	598-49	8,374-86	24-90
February ...	322-04	273-41	4-36	160-490	498-35	6,999-77	21-74
March .....	303-77	247-58	4-45	161,078-5	530-26	7,167-86	23-60
April .....	295-89	254-62	4-51	160,917-5	543-11	7,253-42	24-48
May .....	300-89	258-87	4-63	166,231-5	552-47	7,693-43	25-57
June .....	306-20	259-01	4-61	158,964-5	519-15	7,325-16	23-92
July .....	312-66	258-47	4-57	177,550-5	567-87	8,105-57	25-92
August ....	318-71	256-16	4-44	188,807-5	592-41	8,388-10	26-32
September .	322-88	257-18	4-40	201,943-5	625-44	8,882-46	27-51
MEANS ....	305-52	256-23	4-36	---	6,853-16lbs. or 685-32galls.	---	298-63
Total production for year .....				2,093,777lbs. Milk	---	91,238-02lbs. Butterfat	---

Attention should first be drawn to the general output of all herds comprised within the Association over a period of 12 months. This was represented by 209,377.7galls. of milk and 91,238.02lbs. of butter fat from an average of 305.52 ordinary dairy cattle. If these figures are reduced to individual mean output, we get 685.32galls. of milk and 298.63lbs. of butter fat per annum. Or, if we adopt an estimate common among farmers, we have an approximate mean output of 6lbs. 10ozs. of butter per week per cow throughout the year.

This general mean output from 18 herds compares very favorably with the most recent results issued by the Commonwealth Statistician concerning State general mean outputs. These data have been summarised below in Table II.

TABLE II.—*Showing Mean Milk Yields per Cow, 1914-18.*

	1914.	1915.	1916.	1917.	1918.	Means.
	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.
Victoria.....	306	268	397	391	368	346
South Australia.....	223	261	363	353	323	305
New South Wales.....	305	243	304	326	277	291
Queensland.....	257	194	256	284	224	243
Tasmania.....	209	209	267	266	256	241
Western Australia.....	190	215	220	210	213	210
Commonwealth.....	287	240	320	333	293	264



## Sow poor, pigs stunted, but Karswood Pig Powders soon fixed them up.

No pig raiser can afford to be without Karswood Pig Powders. To give breeding sows a Karswood Pig Powder three times a week before pigging, and every other day after, has been proved the finest treatment in the world. Karswood Pig Powders put the sow in fine fettle; pigging is robbed of risk, and strong litters result. Karswood Pig Powders make pigs thrive. A pig which goes "off its legs" can neither thrive nor fatten. Karswood Pig Powders put this right as the following letter proves:—

### ALL RIGHT IN ONE WEEK AFTER KARSWOOD PIG POWDERS.

Fulbrook Farm, Woodcote, Reading, Eng.  
I feel I must write to you and let you know an experience I had with a sow and litter of nine pigs I bought last February. When I purchased same the sow was very poor, and the pigs small and "stunted." The man who had owned them had been feeding the sow on "wash" and raw potatoes. When I got them home I started feeding the sow on "wash" and "toppings" three times a day. This went on for two weeks with no improvement in either sow or pigs, and so at last I got two dozen Karswood Pig Powders. In a week there was a marked improvement, and by the time the pigs were weaned (eight weeks old) they were as good as my other litters. When I bought them I gave £16 for the lot, and sold the nine pigs for £1 each and the sow for £14 10s., £23 10s., altogether—thanks to Karswood Pig Powders. I have kept pigs for eleven years, and strongly recommend Karswood Pig Powders to any pig keeper.  
R. F. HALL.

July 8th, 1919.

### SOW WEAK IN HIND LEGS. SOON FIT AND FAT AFTER KARSWOOD PIG POWDERS.

Polle Farm, Whitestone, nr. Exeter, Eng.  
I had a sow that went weak in the hind legs, and put her to fatten. The food given no doubt helped her a little, but I can say that since taking the Karswood Pig Powders she has come on in quite a surprising way. She went off her food whilst fattening and I gave her a dose of Karswood Pig Powders, and kept it up, and she took to her food at once after the dose, and has done so ever since.  
M. W. FORRESTER.

October. 17th 1920.

### SIZES AND PRICES:

Karswood Pig Powders are sold by Australian dealers at 1s. 4d. per packet of twelve powders (with a valuable booklet in pigs, illustrated, in each packet). If your local storekeeper or produce dealer does not supply, write to the wholesale Agent (see address below), who will send you the address of a dealer who does sell them, and see that you are supplied.

### AGENTS FOR SOUTH AUSTRALIA—

**South Australian Trading & Milling Co., Ltd.,**  
**BAKER STREET, PORT ADELAIDE.**

NOTE.—Karswood Pig Powders are made in Manchester, England, by E. Griffiths Hughes, Limited. Established 1756, in the reign of George the Second.

It is further of interest to note that according to the report of the Central Council of Milk Recording Societies of Great Britain, representing 30 affiliated societies, 46,593 cows yielded between October 1st, 1919, and September 30th, 1920, an aggregate output of 22,694,106.35galls. of milk, representing a mean output of 487.07galls. per cow, which is considerably below the mean output of the River Murray Herd Testing Association.

As might have been expected, milk production during the course of the year has varied more or less from month to month. These variations are influenced mainly by feeding facilities available at the time, although no doubt the usual exposure to rough weather or extreme heat will not have been without effect. The months of September (62.54galls.), October (63.93galls.) and November (60.01galls.) would appear to have been the best milking months; whilst February (49.84galls.), March (53.03galls.), and June (51.92galls.) were the worst. More enlightened feeding practices and reasonably adequate shelter would no doubt tend to improve milk yields during these months.

#### RETURNS FROM INDIVIDUAL HERDS.

We may now pass on to the returns of individual herds. Importance attaches to the latter in view of the award of special Government prizes to the three best performers. Details concerning them have been shown below in Table III.

TABLE III.—*Showing 1920-21 Results of Herds Included in River Murray Herd Testing Association.*

Herd No.	Period Under Test.	Mean Cows in Herd.	Mean Cows in Milk.	Milk.		Mean Butterfat Percentage.	Butterfat.	
				Total.	Per Cow.		Total.	Per Cow.
	Months.	Cows.	Cows.	Lbs.	Lbs.	Per Cent.	Lbs.	Lbs.
1/G	12	46.23	39.01	434,194.5	9,392.05	3.88	16,841.20	364.29
1/A	12	12.30	10.53	87,434.5	7,108.50	4.74	4,146.92	337.15
1/J	12	15.90	13.20	108,146.5	6,801.67	4.54	4,908.61	308.72
1/E	12	14.44	12.01	91,881.0	6,362.95	4.78	4,389.45	303.98
1/I	12	12.70	10.54	92,372.5	7,273.43	4.17	3,851.97	303.30
1/D	12	19.46	16.63	116,678.0	5,995.79	4.93	5,751.46	295.55
1/C	12	45.07	36.54	322,489.5	7,155.30	4.12	13,286.12	294.79
1/L	12	12.96	10.85	81,572.0	6,294.14	4.61	3,759.03	290.05
1/K	12	13.49	11.08	82,681.0	6,129.06	4.53	3,749.16	277.92
1/B	12	14.37	12.28	89,254.0	6,211.13	4.47	3,988.04	277.63
1/H	12	14.99	12.39	92,347.5	6,160.61	4.36	4,028.24	268.73
1/F	12	11.00	9.37	66,995.5	6,090.50	4.18	2,797.46	254.32
1/M	12	17.36	14.47	81,490.0	4,694.12	4.76	3,381.93	223.61
1/O	10	29.21	23.68	153,957.5	5,270.71	4.70	7,243.09	247.97
1/P	10	19.44	16.20	90,539.5	4,657.38	4.54	4,113.17	211.68
1/R	5	12.33	12.29	33,908.0	2,750.04	4.84	1,640.20	133.03
1/N	4	20.00	19.40	46,033.5	2,301.68	4.35	2,001.39	100.07
1/Q	2	17.58	15.02	21,802.0	1,240.16	3.95	860.58	48.95

In the first place it should be noted that out of the 13 herds that completed the 12 months' test practically 12 of them showed a mean output per cow of 600galls. of milk or over. Again, out of the same 13 herds, five yielded over 300lbs. of butter fat per cow, which renders them eligible for Government prizes, and one over 350lbs. These general results are highly creditable to the society in its first year of operations, and there is every reason to believe that they will be improved upon in future years.

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#### HERD 1/G (MR. J. A. HALLIDAY).

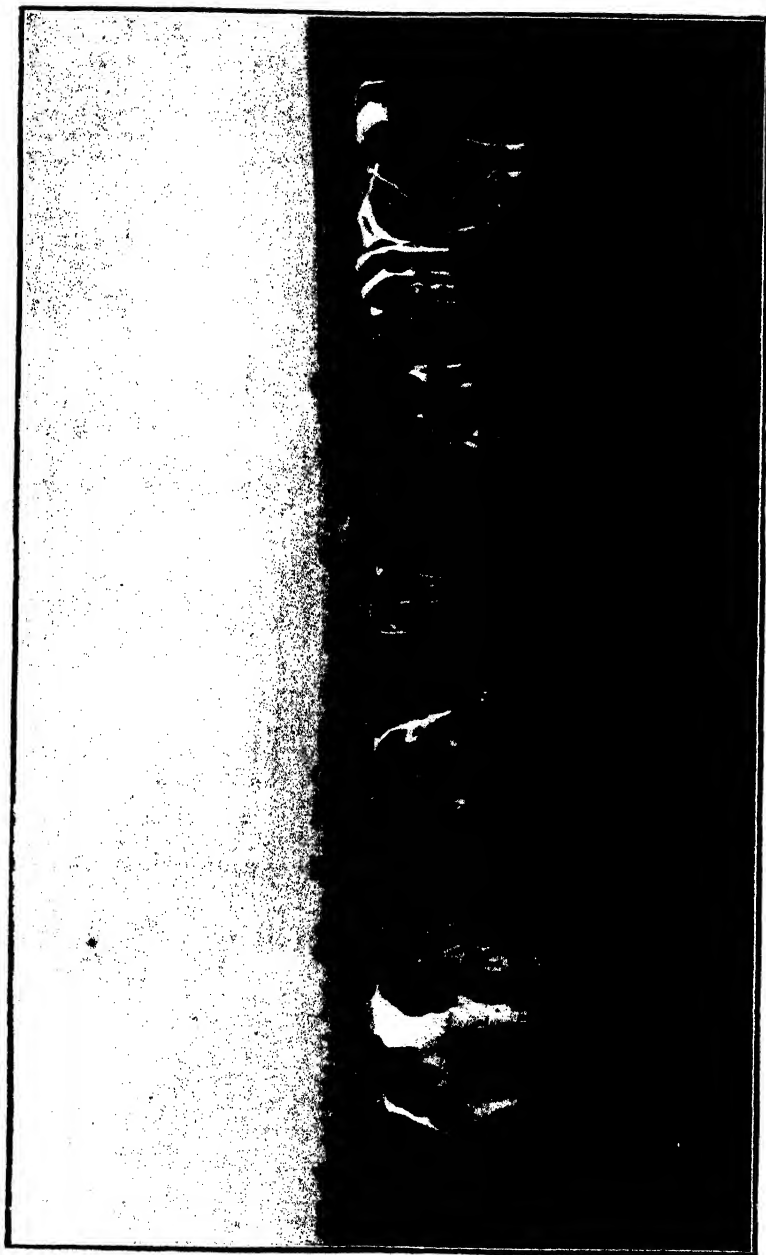
This fine herd, which during the course of the 12 months' test averaged 46.23 head, yielded the highest milk aggregate per cow (939.21galls.) and the highest mean output of butterfat (364.29lbs.); the latter converted into mean butter production per week is represented approximately by 8lbs. 1oz. On the other hand, the mean butter fat percentage—3.88 per cent.—was the lowest of all the competing herds. This feature, however, is characteristic of the Friesian breed, of which the herd mainly consists. Mr. Halliday is certainly to be congratulated on these results, which have won for him the Government first prize of £75.

The herd consists mainly of pure and high grade Friesians, with a couple of Shorthorn crosses. Mr. H. J. Apps, who examined the herd on behalf of the department towards the end of the first year's operations, reported it to be in splendid condition, and an object lesson to farmers in demonstrating what the consistent use of pure-bred sires of the same breed can do towards grading up an originally typeless herd.

The approximate ages of cows comprised in the herd are indicated below:—

Cows on their first calf . . . . .	11
3 years old . . . . .	1
3½ years old . . . . .	3
4 years old . . . . .	9
5 years old . . . . .	11
Aged . . . . .	17

Fourteen of Mr. Halliday's cows completed their lactation periods during the society's first year of operations, and, owing to the general success of the herd, it is thought that details concerning them will not be without interest, and they have been given in Table IV.



Portion of Mr. J. A. Halliday's First Prize Winning Herd of Dairy Cattle.



TABLE IV.—*Showing Returns from Mr. Halliday's Cows which Completed Their Lactation Periods between 1/10/20 and 30/9/21.*

Name.	* Type.	Age.	Milk.			Butterfat.	
			Days in Milk.	Mean per Day.	Total.	Mean Percentage.	Total.
		Years.	Days.	Lbs.	Lbs.	%	Lbs.
Donald's Maid ..	Friesian ..	5½	247	49·20	12,152	3·71	450·29
Florence .....	" ..	10	305	31·84	9,711	4·05	393·21
Bolivar .....	" ..	10	236	39·54	9,331	3·47	324·10
Winnie Revel ..	" ..	3½	262	35·37	9,266·5	3·58	331·82
Gretchen II. ..	" ..	4	285	31·07	8,855	3·62	320·72
Belgium .....	" ..	5	248	35·54	8,814	3·75	330·15
Dot Donald ...	" ..	6	272	32·19	8,756	3·94	345·02
Gretchen .....	" ..	9	266	31·88	8,480	3·96	335·95
Plum Revel II.	" ..	4	251	30·76	7,721	3·47	268·36
Belle Revel....	" ..	4	258	28·68	7,398·5	4·24	313·92
May Queen ....	" ..	9	261	28·34	7,397·5	4·01	296·56
Beauty Annette	" ..	9	272	26·55	7,220	4·04	291·67
Rita Revel ...	" ..	2	319	20·13	6,421½	3·86	247·78
Pretty Maid ..	" ..	2	243	19·10	4,642½	4·42	205·10

The above results must be looked upon as highly satisfactory. The difference between commercial herd testing, which is interested mainly in maximum yearly output, and pedigree herd testing, which is usually confined to single lactation periods, may be illustrated by the performances of "Donald's Maid." This cow calved on October 13th, 1920, and again on August 18th, 1921. The milk produced during her lactation period of 247 days amounted to 1,215galls.; actually, however, during the 12 months' lactation period "Donald's Maid" was in milk for 286 days, and yielded 1,515½galls. of milk.

In this herd, 40 cows were under test throughout the 12 months; they were in milk for an average period of 299·7 days each, which implies that 17·9 per cent. of the herd were out of use throughout the year, a somewhat high percentage for a dairyman's herd.

Finally, it should be stated that Mr. Halliday is not only the owner of a fine lot of dairy cattle; over and above this he is an intelligent and liberal feeder. Without this special quality the best cows in the world must have failed him in the contest. In October and November the cows were fed mainly on lucerne and green oats and barley. In December and January, green lucerne was still the main staple, with the addition of a little wheaten chaff. From February to April lucerne was fed in conjunction with green maize and millet. May record was omitted. In June and July lucerne was still available for grazing. In the earlier month heavy rations of oats, wheat, and barley, together with linseed, bran, and maize ensilage, were fed in addition; whilst in July maize ensilage and bran alone supplemented lucerne grazing. In August lucerne was again grazed, and supplemented with lucerne hay, linseed, and maize ensilage. Finally, in September green oats supplied grazing, and maize ensilage and crushed oats were complementary foodstuffs.

## HERD 1/A (MR. B. H. GREEN).

Mr. B. H. Green's herd was awarded the Government's second prize of £25. The mean number present in the herd during the 12 months was 12.30 head; the mean milk yield was 710.85galls. per cow, and the butterfat yield 337.15lbs. per cow. The mean butterfat test—4.74 per cent.—was relatively high. Mr. H. J. Apps reports this herd to consist mainly of Jersey grades, with a few Shorthorn crosses. He adds that they are a nice deep bodied lot of cows, and in good milking condition. Mr. Green is at present making use of a Friesian bull, with possible intentions of grading up to this breed. Mr. Green is to be congratulated on his success. The ages of cows in Mr. Green's herd were as follows:—

2½ years old . . . . .	1
4 years old . . . . .	2
5 years old . . . . .	1
Aged . . . . .	11

Eleven cows in this herd were present, and registered from October 1, 1920, to September 30, 1921. They averaged 310.36 days in milk, representing about 15 per cent. of the herd out of use during the course of the year.

Two of Mr. Green's cows completed lactation periods during this year's operations. Of these "Cherry," a seven-year-old grade Shorthorn, yielded 768.8galls. of milk and 332.15lbs. of butterfat, with a mean butterfat test of 4.32 per cent. "Kitty," a five-year-old grade Jersey, yielded 735.6galls. of milk, with a high mean butterfat test of 5.42 per cent., representing in the aggregate 398.43lbs. of butterfat. Both cows were in use for the maximum period of 319 days; hence the butter production of "Kitty" would be equivalent to an average production of 10lbs. a week over a period of 319 days.

Although, unlike Mr. Halliday, Mr. Green did not avail himself of concentrates during the cold winter months, his general feeding practices appear to have been fairly satisfactory. His cows received chiefly green lucerne, maize, oaten hay chaff, and green oats, according to the season. His lowest milking months were February (37.22galls.) and March (39.77galls.), when a combination of millet, maize, and lucerne were probably fed in insufficient quantities.

## HERD 1/J (MR. G. G. HALL).

Mr. G. G. Hall's herd was awarded the Government's third prize of £10. The mean number of cows in the herd was 15.9; they yielded a mean output per cow of 680.17galls. of milk and 308.72lbs. of butterfat, with a mean butterfat test of 4.54 per cent. Mr. H. J. Apps reported the herd to consist of Jersey and Shorthorn crosses of good dairy type, and adds that they were in good milking condition at the time of inspection. The herd bull is a pure-bred Jersey. Ages of cows in this herd are as follow:—

On first calf . . . . .	2
5 years old . . . . .	3
Aged . . . . .	13

Fourteen of these cows were registered as present from beginning to end of the test, and on the average were in use for 301.36 milking days, which implies that about 17.4 per cent. of the herd were out of use during the course of the year. This is a rather high average for a dairyman.

Mr. Hall's cows were fed mainly on lucerne, maize, millet, green oats, and barley, according to the season. In addition, during the months of March, April, and May they were supplied with crushed oats and lucerne and oaten chaff. Curiously enough, Mr. Hall's lowest milking months were August (39.95galls.) and September (40.44galls.), whilst his best months were December (81.92galls.) and January (80.36galls.). The unexpectedly low mean yield during the spring months is attributable to the fact that whilst the registered herd consisted of 16 head, only 9.9 were in milk in August and 7.63 in September.

Ten cows in this herd completed their lactation periods between October 1st, 1920, and September 30th, 1921. Details concerning them are shown below in Table V.

TABLE V.—*Data Concerning Complete 1920-21 Lactation Periods in Mr. Hall's Herd.*

Name.	Type.	Age.	Days in Milk.	Milk.		Butterfat.	
				Per Day.	Total.	Per Cent.	Total.
Judy .....	Grade Shorthorn ..	6	319	23.27	7,424½	4.41	327.26
Darkie.....	Grade Jersey .....	11	319	22.87	7,296	5.34	389.70
Monty .....	Grade Holstein ....	Aged	319	22.69	7,237½	3.92	284.01
Caroline .....	Grade Shorthorn ..	7	273	25.11	6,857	4.51	309.07
Cora.....	Grade Shorthorn ..	5	285	22.64	6,451	4.43	285.94
Midget.....	Grade Shorthorn ..	6	237	23.87	5,656½	4.36	246.82
Snub .....	Grade Jersey .....	2	319	17.61	5,616	4.95	278.29
Bluey .....	Jersey .....	5	254	21.27	5,402	5.91	319.51
Rose .....	Grade Shorthorn ..	10	274	17.81	4,880½	4.38	213.96
Cosy.....	Jersey .....	2½	276	15.59	4,302	5.49	236.00

As the result of these tests, one would imagine that Mr. Hall would feel disposed to get rid of "Rose."

Mr. Hall is to be congratulated on the position which he secured in these tests.

I shall make brief reference to two other herds, which yielded a mean output of butterfat in excess of 300lbs. per annum.

#### HERD 1/E (MR. E. W. PATERSON).

This herd averaged 14.4 cows, and yielded a mean output per head of 636.3galls. of milk and 303.98lbs. of butterfat, with an average test of 4.78 per cent. The herd consists mainly of Jersey and Shorthorn crosses, and unfortunately with a grade Jersey bull at the head of



the herd. The 14 cows which were on the register throughout the period averaged 300.79 milking days, representing 17.6 per cent. of the herd out of milk over the course of the year.

Mr. Paterson's lowest milk month was November (33.97galls.). This low figure is attributable to the fact that five out of 14 registered cows were at the time out of milk. Low yields in June (47.20galls.) and July (47.48galls.) were probably due to insufficient feeding or exposure to rough weather.

#### HERD 1/I (MR. P. H. PICKERING).

Mr. Pickering's herd averaged 12.7 cows, which returned a mean yield per head of 727.34galls. of milk and 303.3lbs. of butterfat, with a mean butterfat test of 4.17 per cent. The milk output of Mr. Pickering's herd is second only to that of Mr. Halliday in this year's operations. Its relatively low butterfat test has, however, cut it out from a higher position among competing herds. Ten of Mr. Pickering's cows were on the register throughout the period, and averaged 302.9 milking days, representing 17 per cent. of the herd out of use throughout the year. The herd consists of Illawarra and Grade Shorthorns. The ages of cows in Mr. Pickering's herd are as follows:—

On first calf . . . . .	5
4 years old . . . . .	1
5 years old . . . . .	6
Aged . . . . .	5

Three of Mr. Pickering's cows completed lactation periods between October 1st, 1920, and September 30th, 1921. Of these, "Cherry," a five-year-old Illawarra, was 279 days in milk, during which time she yielded 810galls. of milk and 337.15lbs. of butterfat. The two others yielded respectively 700galls. and 462½galls. in 319 days.

From the records supplied us, Mr. Pickering appears to have been a fairly liberal feeder. He had berseem available for grazing in October and November. In other months paspalum, lucerne, Sudan grass, barley, oats, and maize were available; whilst, when necessary, oaten chaff, bran, and oats were also supplied. Mr. Pickering's worst milking month was February (40½galls. of milk), when, however, four out of 15 registered head were dry. March (42½galls.) and April (50galls.) were also rather low.

#### CONCLUSIONS.

In conclusion it may be said that River Murray dairymen are to be congratulated on their enterprise in initiating co-operative dairy herd testing in this State, and it is greatly to be desired that their example may be followed in other suitable localities. How great may be the differences in the value of the output between herds handled under similar conditions of climate and soil is shown in the concluding table below. It should be the object of co-operative herd testing to reduce these differences to a minimum by eliminating undesirable

milkers and establishing rational feeding practices. From the latter point of view, there are few more potent agents calculated to lead to increased rural production than Dairy Herd Testing Associations.

TABLE VI.—*Showing 1920-21 Values of Outputs from 13 Continuously Tested Herds in River Murray Herd Testing Association.*

Herd No.	Milk Per Cow.		Butterfat Per Cow.		Value of Skim Milk at 2d. Per Gall.	Combined Value of Butterfat and Skim Milk.
	Quantity.	Value at 11d. Per Gallon.	Quantity.	Value at 1s. 4d. Per Lb.		
	Galls.	£ s. d.	Lbs.	£ s. d.	£ s. d.	£ s. d.
1/G .....	939-21	43 1 0	364-29	24 5 9	6 18 6	31 4 3
1/A .....	710-85	32 11 7	337-15	22 9 6	5 4 10	27 14 4
1/J .....	680-17	31 3 6	308-72	20 11 8	5 0 4	25 12 0
1/E .....	636-30	29 3 3	303-98	20 5 4	4 13 10	24 19 2
1/I .....	727-34	33 6 9	303-30	20 4 5	5 7 3	25 11 8
1/D .....	599-58	27 9 7	295-55	19 4 1	4 8 5	23 12 6
1/C .....	715-53	32 15 11	294-79	19 13 1	5 5 6	24 18 7
1/L .....	629-41	28 17 0	290-05	19 6 9	4 12 10	23 19 7
1/K .....	612-91	28 1 10	277-92	18 10 7	4 10 5	23 1 0
1/B .....	621-11	28 9 4	277-53	18 10 0	4 11 7	23 1 7
1/H .....	616-06	28 4 9	268-73	17 18 4	4 10 10	22 9 2
1/F .....	609-05	27 18 4	254-32	16 19 11	4 9 10	21 9 9
1/M .....	469-41	21 10 3	223 61	14 18 2	3 9 3	18 7 5
Associa- tion Mean	685-32	31 8 3	298-63	19 18 2	5 1 1	24 19 3

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## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

## THIRTY-SECOND ANNUAL CONGRESS.

(Continued from page 427.)

## SMYRNA FIG CULTURE.

The following paper was read by Mr. C. G. Savage, Manager, Government Experiment Orchard, Berri, River Murray:—

It is with the object of calling attention to an industry that is capable of wide extension in Australia that this subject is brought before this Congress.

The Smyrna fig, which produces the dried fig of commerce, is grown largely around the Mediterranean, the main Commonwealth importations coming from Turkey. In recent years small parcels have been received from California.

The climatic and soil conditions are such in our State as to allow of the wide cultivation and drying of this fruit, and there is no reason why all the dried figs required for Australian consumption should not be produced in our own country. The present annual importations are approximately 225 tons.

That dried figs can be produced in this State equal, and superior, to the imported article has been demonstrated at the Experiment Orchard at Berri. One will be pardoned for referring to a buyer's comment upon the figs received, "There is no question as to the product being a credit to the State and those responsible for its get-up." If figs can be produced to warrant such commendation in one orchard, the same results may be won from others.

## ORIGIN AND BOTANICAL DESCRIPTION.

The fig, which is probably one of the oldest of our cultivated fruits, is indigenous to Asia Minor and Syria, and has been cultivated in these areas from early historical times. Through dissemination through the ages, it is now found in the wild state in many countries surrounding the Mediterranean. Frequent reference to it in the Bible shows that it was widely known and cultivated in the early Christian era, and probably formed a valuable food supply of that time.

The figs which are cultivated commercially belong to the species *Ficus carica*. The fruit is a syconus, being formed by a hollow pear-shaped capitulum bearing male or female flowers, or both staminate and pistillate flowers. The sunflower is a capitulum; in this bloom there are many flowers without stalks, crowded together on a thick, short parent axis. Imagine the circumference of this capitulum drawn together so that the flowers are enclosed—this would give a fig-like fruit. The top of the fruit ends in an ostium or orifice, commonly known as the eye; this is surrounded by a number of bracts.

By far the greatest number of our cultivated figs contain female or pistillate flowers, and ripen their fruits without the ovules being fertilised. The Smyrna fig also contains pistillate flowers, but the fruit does not mature and ripen unless the flowers are fertilised. The capri fig is the wild or goat fig, the fruits of which are inedible, but contain staminate and modified pistillate flowers, the staminate flowers producing the pollen which is required to fertilise the Smyrna fruits. The pollen is introduced to the female fruits from the male figs by the agency of a minute insect or fig wasp, known as *Blastophaga grossorum*.

#### SOIL AND CLIMATIC CONDITIONS.

The fig tree will flourish and produce payable crops over a wide range of soils; the climatic conditions more than the type of soil tend to limit the area over which figs can be profitably grown. The size and quality of the fruit is likely to be influenced by the soil in which the tree is growing. Better quality figs are usually grown on soils containing a fair percentage of clay than on very light, sandy lands. Next to a well-drained loamy soil, the fig delights in a rich sandy loam. The fig requires a fair amount of lime in the soil to produce the finest quality fruits.

This tree favors a warm, dry climate, but also grows well in a moist one. The difficulty with the latter climate, especially where cold nights are experienced towards the end of the summer, accompanied by heavy dews, is that the fruit is liable to split and sour. The Smyrna fruit does not ferment so readily as the non-caprifried common varieties of figs, so that for fresh fruit purposes it can be grown over a wider area.

Owing to the ripening period extending late into the summer months, and often in the early autumn, a climate with warm, dry nights is essential for the sun drying of the fruits. This being the case, one must look for the greatest extension of the dried fruit industry along the Murray Valley. Experience teaches that soil and climatic conditions, assisted with irrigation, and thorough cultivation, are such that figs of the Smyrna variety can be produced in the Murray Valley equal to any grown the world over.

On the Adelaide Plains, and in many of our Northern fruit centres, the dried fruit industry can be widely extended. Where the orchards are situated in close proximity to the city or large towns, the fresh fruit trade should prove a valuable one.

#### HISTORICAL.

Some 30 odd years ago the Chamber of Manufactures imported into this State from Smyrna the Lop Ingir Smyrna fig and what is now known locally as the large-fruited capri fig. Owing to the absence of the fig wasp, though both the capri and Smyrna trees bore crops of fruit, the female figs were not caprifried, and fell from the trees in an immature state.

Mr. T. B. Robson, of Hectorville, who has some of the original trees in his possession, and to whom the honor is due for establishing the *Blastophaga* in Australia, fertilised some of these early fruits by artificial methods. In the first instance a small piece was cut out of the

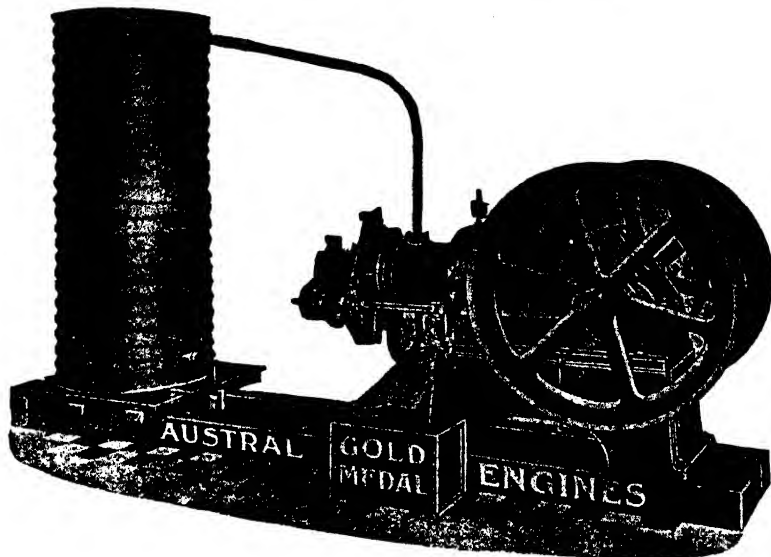


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apex of the Smyrna figs, and a corresponding portion of a capri fig, carrying staminate flowers producing viable pollen, was inserted in the opening. Several figs which were fertilised in this way matured and ripened. At a later date the pollen was collected from the capri figs and blown into the Smyrna fruits by the aid of a rubber ball attached to a small pointed glass tube.

Though these methods could not be followed out on the commercial scale, they had their value, in that by this means it was established that the Smyrna fig could be satisfactorily grown if the *Blastophaga* could be introduced. It is interesting to note that the seeds from some of these artificially caprified fruits were sown, and several seedling fig trees were raised. One of these trees proved to be a large-fruited capri, which matures its spring crop of figs somewhat later than the other varieties, thus extending the period of caprification, which is very desirable, as more Smyrna figs may be fertilised, thus increasing the yield of fruit.

The experiences of the Californian growers in establishing the fig wasp in that State were somewhat trying and difficult. Though the first importation of the insect was made in 1892, it was not until some seven years later that the *Blastophaga* was established. Since that time the insect has been successfully carried over from season to season.

Mr. T. B. Robson had somewhat similar experiences. They were as follows:—In March, 1905, the first lot of capri figs containing the wasp in the larvæ form was received from Mr. G. C. Roeding, of California, but though the figs arrived in good condition, it was too late in the season to establish the insects; the weather being cold, the *Blastophaga* perished. The next consignment was sent per parcel post in October of the same year, but the insects were all dead on arrival. In February, 1906, a further supply was received, but though the figs appeared in good condition, the wasps did not emerge; probably the figs were too immature when gathered. In March, 1906, another parcel was dispatched, and was received in April in good order, but the weather again proved too cold for the wasps. The next lot was received in September, 1907, but the figs arrived in a bad condition; while the parcel sent in March, 1908, was lost in transit. The consignment sent in September, 1908, like the last one received from California early in April, 1909, also arrived in a bad condition.

As the *Blastophaga* had been successfully established in South Africa in 1908, Mr. Robson received two packages from there in August and September, 1909. On September 15th the insects began to issue from the figs, and established themselves in Mr. Robson's capri trees. Since that time no difficulty has been experienced in carrying the insect over from season to season.

It is interesting to note that at the same time that the parcels of infested figs were sent to Mr. Robson from South Africa, packages were also sent to Western Australia, and though a good crop of Smyrna figs was produced, the insect was lost, owing to the capri fig trees failing to carry a summer crop. Mr. Robson then supplied figs containing the wasp to the Western State in September, 1910, but, owing to the same cause, the *Blastophaga* was again lost. In the following year a further supply was sent over, from which figs the wasp was established.

From supplies obtained from Mr. Robson, the *Blastophaga* was established at the Adelaide and Blackwood Experimental Orchards, in 1912 and 1913, and from thence in 1917 at the Berri Experimental Orchard. Consignments were also sent to and the wasp established in various centres of the Commonwealth.

#### DESCRIPTIONS OF THE CAPRI AND SMYRNA FLOWERS AND FRUITS.

As previously mentioned, the capri fruits contain both staminate or male and pistillate or female flowers, while those of the Smyrna contain only pistillate flowers.

The formation of the female flowers is somewhat different in the two varieties, the individual flower of the Smyrna fruit has a long, slender style and a one-celled ovary; that of the capri is similar in formation, with the exception that the style is short, stubby, and hollow. It is in these modified pistillate flowers of the capri fig that the female *Blastophaga* deposits her eggs, and which serve as the place of development of the larvæ.

The male flowers are carried towards the apex of the capri fig, and the gall or modified female flowers are situated below them; the insect in emerging from the fig must necessarily pass through the staminate flowers, and when the pollen is being freely shed the wasp becomes covered in the yellow grains.

There are three crops of capri figs, known as the spring or profichi crop, the summer or mammoni crop, and the winter or mamme crop.

*The Profichi Crop.*—This is the one which is used for caprifying the Smyrna figs, the fruits being produced in great numbers. The male flowers of these fruits supply an abundance of pollen, which is transferred to the Smyrna flowers by the agency of the fig wasp. The fruits may be of two kinds when mature, those which contain insects, and are known as insectiferous figs, and those which do not, and are designated polleniferous figs. The former develop normally, and keep dark-green and plump until mature; the latter ripen early, turn yellow, and fall from the trees. The polleniferous are of no value for caprification purposes, owing to the absence of wasps to convey the pollen. The figs of this crop push out from the wood of the previous season's growth, and occasionally from older wood.

*The Mammoni Crop.*—The figs of this crop appear in the axils of the leaves on the current season's growth. The figs are few in number, and much smaller than those of the profichi crop, and are ready to receive the wasp as they emerge from the spring crop.

*The Mamme Crop.*—This crop is the one that carries the wasp in the larval form over the winter months. The figs appear in the same position on the tree as the preceding crop, but are produced later in the season. The staminate flowers of this crop rarely produce viable pollen.

*The Smyrna Fig.*—There are two crops of Smyrna figs; the brebas or first crop is very light, and owing to the absence of pollen in the mamme crop of capri fruits, it is not fertilised, the figs falling in an immature condition from the trees. The higos or second crop is the one which is caprified by the pollen from the profichi capri figs, and produces the dried figs of commerce.

## THE LIFE HISTORY OF THE "BLASTOPHAGA GROSSORUM."

The female wasp is less than an eighth of an inch in length, is black in color, and is winged. The male is a small, brownish-yellow insect, blind and wingless; this insect seldom leaves the male fig. There are usually three broods of insects, corresponding to the number of crops of capri figs. The first brood of *Blastophaga* issue in September here from the over-wintering figs, in which they have hibernated during the dormant period of the tree. At this season the very heavy profichi or spring crop of figs is noticed on the capri trees. The male wasp hatches out first, seeks out a gall containing a female insect, gnaws a hole through the cortex of the ovule at the base of the style, inserts its extremely long abdominal extremity, and fertilises the female while she is still in the gall. The female insect enlarges the hole in the gall, and emerges from the fig through the eye. She crawls about the leaves, and makes short, jerky flights, but on a windy day may be carried for a great distance.

The *Blastophaga* then enters the young capri figs; the fruits need only be the size of marbles for the insect to enter, or maybe as large as half-grown walnuts. She passes through the staminate to the modified female flowers, searching out a suitable flower, her ovipositor is pushed down through the central duct of the style, and the egg is deposited in the ovary. The number of eggs that may be laid by a wasp is not definitely known, but probably amounts to several dozen. It is claimed the female seldom lives more than four or five hours if exposed to the sun and wind, but lives longer inside the fig.

The second brood of *Blastophaga* appear in late November and early December; it is this brood that is used for caprifying the Smyrna figs. At this period a light crop of figs is seen on the capri trees, and into these some of the wasps enter and oviposit. This mammoni crop of capri figs carries the insect over the period between early to late summer, when the mamme crop of capri figs is ready to receive it.

The third brood of wasps issue forth in late February and March, and enter the mamme capri figs which carry the insect in the larval form over the winter months. The depositing of the eggs in the mamme figs stimulates the fruit in a similar manner that the fertilisation of the ovules does in other fruits. The figs which the insects do not enter shrivel and fall from the trees, while those in which the wasps have oviposited hang on the trees throughout the dormant period.

## CAPRIFICATION.

The term caprification is applied to the process of fertilising the Smyrna fig with the pollen from the capri fruit by the means of the *Blastophaga* insect.

As already mentioned, the higos or second crop of figs is the one that is fertilised and produces the marketable Smyrna figs. These fruits are ready for fertilisation in late November and early December, at which period the wasps issue from the profichi or spring crop of capri figs. The staminate flowers in the profichi figs produce a plentiful supply of pollen, and the wasps passing through these flowers when emerging from the fruit become dusted over with pollen grains. The insect becomes covered with pollen to such a degree that it is often

necessary for the wasp to divest herself of much of it by stroking her back with her legs.

The capri figs are gathered when the *Blastophaga* commence to emerge, and are distributed through the Smyrna trees. The capri fruits tend to become soft around the eye, and the eye usually opens prior to the wasps issuing forth. As the wasps leave the figs in the forenoon, the fruit should be gathered either in the early morning or late afternoon, and placed in the Smyrna trees as early as possible in the morning.

The old method of hanging the capri figs throughout the Smyrna trees was to string them on raffia or twine in clumps of four to six, and hang them in the branches. This method was costly, slow, and troublesome. The plan now adopted is to hang in the Smyrna trees small receptacles, such as baskets made from small mesh wire netting, into which the capri figs are placed. Each tree should be visited about every three or four days for a period of three weeks, and a fresh supply of wasp-laden figs placed in the baskets.

As all the Smyrna figs on the trees are not ready for caprifying at the one time, but keep developing for some three or more weeks, it is essential when planting the male trees, to plant several varieties that will extend the time in which the fruits mature over as long a period as possible.

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The ostiolum of the small marble-like female fig is closed by the overlapping scales. The *Blastophaga* forces her way under the thin edges of the scales, and after a struggle lasting several minutes, works her way down to the centre of the fruit. The wings of the insect are usually shed, and left protruding from beneath the scales; the wings are visible to the naked eye, especially where several wasps have entered the same fig. On entering the Smyrna fig the *Blastophaga* begins searching for a suitable place to oviposit, but the flowers being unsuitable for the purpose, observers say she crawls from the fig and perishes. In searching among the female flowers the pollen grains are brushed from the insect on to the stigmas, and fertilisation of the ovules takes place.

As the figs develop a rapid change takes place, the caprifried fruits increase in size, become dark-green in color, the distinct ribbed appearance disappears, the figs becoming nearly smooth. Should the wasps fail to enter any of the figs, these fruits shrivel and fall from the trees in an immature condition. The fertilisation of the ovules stimulates the formation of sugar in the fruit; this is particularly noticeable when the unfertilised and caprifried fruits of one of the ordinary varieties of figs are compared when thoroughly ripe. All the figs which ordinarily ripen without being caprifried are much improved in flavor and quality when caprifried; the fruit often grows to a much larger size.

Growers are at times tempted to plant the capri trees throughout the plantation to obviate the work of distributing the figs. This practice has little to recommend it, as the distribution of the wasp is very uneven, the Smyrna fruits in close proximity to the capri trees being over caprifried and those at a further distance not receiving enough of the pollen-bearing wasps. Figs that are over caprifried generally split as the fruit develops, due probably to the rapid expansion of the seeds, as in these figs the whole, or practically the whole, of the flowers are fertilised. The growth of the pulp and seeds appears to be more rapid than that of the skin of the fruit, with the result that the fig is in most cases more or less damaged by splitting when the whole of the flowers are fertilised. In many instances the female figs situated at the greatest distance from the capri trees are not fertilised, and fall immaturally. The best method to adopt is to plant the capri trees in a clump, and to distribute the figs as described.

The number of capri trees required to fertilise a given number of Smyrna trees is in the proportion of one male to 15 to 20 female trees.

Roeding's capri No. 3 has proved one of the most reliable varieties for carrying the wasp throughout the year and for caprifrying the Smyrna fruits. This variety is the first to mature the profichi crop. Roeding's No. 1 is a much smaller fig, which also carries the wasp throughout the season; it is valuable as a variety for extending the caprifification period. The large-fruited and Robson's large-fruited also produce the mamme or overwintering crop, and profichi figs develop later on these than on the No. 3. Roeding's No. 2 capri does not carry the over-wintering figs, so that it is of no value for harboring the insect throughout the winter months, the profichi crop is fairly late in developing, but not more so than the other varieties quoted, consequently is not recommended.

## HARVESTING AND DRYING.

The ripening period extends over three months of the year, during which time the figs ripen gradually, there being no rush of fruit at any particular time, so that a small staff of workmen can handle the fruit from a large plantation. At Berri the gathering of the fig crop commences early in February, and extends through till late April, and at times even into May.

The fruit should never be gathered until thoroughly ripe, in fact, until it has commenced to wilt and hangs limp on the tree. Care must be exercised in picking the fruit, to see that the stems are retained on the figs. This is a very important point in the harvesting, as the stem improves the appearance of the finished article, whereas figs that are pulled from the tree without the stem being retained are always more or less damaged, and produce a ragged, unfinished product. In many cases the fruit is not picked from the trees, but is allowed to fall to the ground before being gathered. The fruit so harvested is in a more or less dried condition when gathered, many of the small figs do not require further exposure to the sun before sweating. The Smyrna fig does not sour or ferment so readily as does the uncaperified fruit that is usually grown for the fresh fruit market, unless exceptionally moist weather conditions prevail. The weather in the Mid-Murray Valley during the early months of the year is usually hot and dry; such conditions favor the ripening and drying of the fig, so that the practice of allowing the fruit to drop before gathering may be followed with safety under ordinary weather conditions. The disadvantage of this practice is that on light sandy soils the figs are liable to be more or less gritty, and are somewhat difficult to cleanse.

The fruit is usually gathered into perforated dipping tins, in which it is immersed into a boiling brine for about half a minute. The brine is made by adding 3ozs. of salt to each gallon of water used. The object of this operation is to fine down and to slightly crack the skin, to facilitate the evaporation of moisture from the figs. This dip will also assist in removing from the fruits any grit that has been gathered from the ground. The figs are then placed on drying trays, and exposed to the sun; should the figs be large and fleshy, a little time spent in placing them with eyes up will be repaid. This will prevent the loss of juice from the fig, will retain the sugar contained in it, and secure the full advantage in weight of dried fruit. The fruit should be turned in a couple of days, there being no fear of loss of juice at this stage, to facilitate drying, and to prevent the larger figs moulding on the underside. With suitable climatic conditions the fruit will be sufficiently dry to sweat in four days to seven days. Should wet weather set in, the fruit-laden trays should be stacked and covered, otherwise the figs will be damaged by the rain, and perhaps by moulds. Towards the end of the drying season it will be found necessary to stack the fruit each evening to protect it from dew, and to open it out to the sun each morning.

The sweating process takes about two weeks, during which time the fruit should be stirred up every three or four days. The object of this operation is to even up the moisture contents of the fruit; some of the figs will be overdried and some slightly underdried, and by placing

them together those containing too little moisture absorb some from the underdried fruit. The fig is considered dry enough to sweat when it is still pliable, but does not exude juice when worked between the finger and thumb. From the sweat box the fruit is passed through the grader to sort it into various sizes. For guidance, the sieves used at the Berri Orchard this season are quoted; the sizes were  $1\frac{1}{2}$  in.,  $1\frac{1}{4}$  in.,  $1\frac{3}{8}$  in., and  $1\frac{1}{2}$  in. mesh. These four sieves gave five grades of fruit; the small, together with the split and damaged, figs are sold for confectionery purposes; the next grade, which is labelled 1 Crown, was packed in 56lb. boxes; and the three top grades, designated 2, 3, and 4 Crown, were packed and sold in 1lb. cartons under the name of "The Golden Figs of Berri." The four packed grades contained, approximately, the following number of figs per pound:—1 Crown, 32 to 38; 2 Crown, 22 to 28; 3 Crown, 18 to 20; 4 Crown, 14 to 16. The proportion of the various grades to whole crop was, approximately:—

	Per Cent.
Manufacturers' grade . . . . .	12 $\frac{1}{2}$
1 Crown . . . . .	12 $\frac{1}{2}$
2 Crown . . . . .	18
3 Crown . . . . .	41
4 Crown . . . . .	16

Before packing, the figs are washed in a cold brine (3ozs. of salt to each gallon of water) to remove any grit that may have collected on them during drying operations, and are exposed to the sun for half a day to dry off the added moisture. The fruit is then placed in a steam bath for 10mins. to 15mins.; this process fines down and softens the skin, and may also destroy some of the insect eggs that may have been laid upon the fruit. The fruit is then weighed into pounds, and is packed into moulds of slightly less width and length than the cartons, the depth being greater, to allow the fruit to be pressed without squeezing over the edges of the mould. Before placing in the moulds, the fruit is flattened between the finger and thumb, the first layer of figs is placed with the stem end down, and the top layers with the stem uppermost. This method of packing has two main advantages; firstly, the fruit presents a uniform appearance if opened on either top or bottom. Secondly, the tops of the figs, where the toughest portion of the skin is found, are towards the centre of the block of fruit, where the greatest amount of moisture will be; this will greatly assist in keeping the whole of the fig soft and pliable. The fruit is wrapped in greaseproof paper before placing in the carton. Figs from other countries are also packed in  $\frac{1}{2}$  lb., 1lb., and 7lb. boxes.

#### RETURN PER ACRE.

Local data in relation to the quantity of dried fruit produced by an acre of fully-grown Smyrna fig trees is very meagre. From the Berri plantation the data collected during the season just ended is quoted herein. Unfortunately, a fair proportion of the trees are planted in salty land, consequently such trees have not grown strongly, nor have they carried crops equal to that gathered from the normally developed trees. The trees were planted in 1914, and to arrive at somewhat definite data of what weight of fruit might be expected from an acre



of Smyrna trees in their eighth year, a block of 40 well-developed trees growing in sandy loam soil was selected. The fruit from these trees was gathered and dried, the returns being equal to 2,980lbs. of dried figs per acre. As these trees have not reached their full size, an increase in yield may be reasonably expected for several years.

Smyrna dried figs prior to the war were imported at about 1s. 1d. per pound. Allowing this price to be for the higher grade figs, and that for the lower grades of fruit decreasing in value to 7d. per pound for the manufacturers' figs, the gross return per acre would be, approximately, £140 from a plantation in its eighth year.

The expenses approximate about £97, made up as under:—

	£	s.	d.
Water rates and rent . . . . .	3	5	0
Cultivation, ploughing, irrigating . . . .	10	0	0
Manures . . . . .	3	0	0
Harvesting and drying . . . . .	20	0	0
Grading and packing . . . . .	50	10	0
Interest on capital and depreciation on plant . . . . .	10	5	0

The nett return, £43 per acre.

£97 0 0

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### USES OF THE FIG.

The value of the Smyrna fig lies in the high-class dried article that it produces, and as such no other variety can compare with it. The dried fig is used medicinally as a mild laxative, is also used extensively in confectionery and in making fig coffee. As a fresh fruit this variety will be largely used in preference to others as it becomes more widely known; the high quality of the fruit makes it most valuable as a dessert, jamming, or preserving sort.

### PROPAGATION.

The fig is cultivated from offsets and cuttings. The cuttings which are cut about a foot in length should be selected from well-developed wood of the previous summer's growth. If properly cultivated and irrigated throughout the summer, the cuttings root readily, and produce fine sturdy trees for planting out during the next winter.

### PRUNING.

When planted out, the tree should be headed back to within 15in. to 18in. of the soil. The tree should be pruned vase shaped, and a solid foundation built in the lower branches during the first three or four years. The subsequent treatment consists in removing crossing shoots and spent fruiting wood, very little pruning being required on older trees.

### DISEASES AND PESTS.

The fig tree is less liable to be attacked by fungoid diseases and insect pests than any of our cultivated fruits, and up to the present it has not been found necessary to give any treatment in this direction.

### COTTON GROWING.

Mr. H. S. Taylor, of Renmark, spoke on cotton growing, in which he said he had been interested for 20 years. There was a movement to make the Empire self-supporting in connection with this important commodity. He urged members who thought their districts suitable for the production of cotton to make experiments in planting during the coming summer. The Federal authorities had just received 1,000lbs. of cotton seed raised in California, and selected by the United States Department of Agriculture. It was a variety suitable for culture in California and should be worth trying on the river. The seed would be procurable from the State Departments of Agriculture, and all experiments, which were likely to be conducted this year, would be subject to quarantine conditions. If it yielded anything like what Mr. Crawford Vaughan thought it would, it would produce one of the most valuable crops on the river. Queensland was destined to become one of the great cotton growing parts of the world.

**Evening Session.****THE PIG INDUSTRY: A NEGLECTED SOURCE OF NATIONAL WEALTH.**

The following paper was read by the Director of Agriculture (Professor Arthur J. Perkins):—

**INTRODUCTORY.**

For many years past, and perhaps both in and out of season, I have been endeavoring to draw attention to the stagnation of our pig industry, and to the national importance of extending it and building it up on a scale commensurate to that obtaining to-day in other progressive agricultural countries. But, in so far as direct results are concerned, I am bound to admit failure, and to-night in again pressing this question upon your notice, I know that I am incurring the risk of finding myself dubbed a public nuisance. I am sanguine, however, that time will, in due course, bring about a reversal of judgment, and if I can succeed in showing what the pig is doing for other countries, and what, if given a chance, it may be expected to do for us, it is possible that your deliberations may help to hasten on the millenium when nine farmers out of every ten will rear or fatten pigs for market.

**THE SUITABILITY OF GENERAL LOCAL CONDITIONS.**

I have never hitherto thought it necessary to defend the position from the point of view of the general adaptability of local conditions to pig-rearing. I have always assumed this to be self evident, and not likely to be seriously disputed. It was, therefore, with considerable surprise that I heard it recently suggested that if pigs have not made greater progress in our midst, it is probable that there is something amiss with their surroundings. I understand, too, that in Victoria, at all events, it is alleged that dairy-reared pigs are not always as healthy as could be desired. In passing, I shall state in this connection that it is too often assumed that pig-raising is the exclusive preserve of dairymen. I do not deny that it fits in admirably with their other avocations, but I am also of the opinion that the general farmer can handle pigs quite as successfully as the dairyman. But these whispers about unhealthy pigs, are they not to be traced to the insanitary conditions under which pigs are frequently kept rather than to any abiding defect in the natural conditions of the country? If pigs were allowed a maximum of grazing and a free, open life, and a minimum of insanitary sty, we should hear little or no complaints as to defective health. And these conditions they can certainly find on every general farm which is prepared to exploit them. Whatever may be said to the contrary, the general climatic conditions of the Commonwealth in general, and of South Australia in particular, are ideal from the point of view of healthy development in all forms of livestock, pigs not excepted. And, if at rare intervals, we have to face epidemic or sporadic outbreaks of disease, the blame rests, as a rule, with ourselves rather than with the health-giving surroundings with which we have been endowed.

## UNSATISFACTORY CONDITION OF THE PIG MARKET.

But, whatever may be the reason, pigs have not progressed in our midst as well as might have been expected. Thus, in 1919, the pigs of the Commonwealth were estimated at 755,494 or 194,855 less than in 1900, the opening year of Federation, representing a decline of 20 per cent. Nor is the position any better in South Australia; the latest available statistics, 1919-20, give us 60,295 pigs, whereas as far back as 1880 we had more than twice as many, and nearly three times as many in 1884 (*vide* Appendix, Table I.). In every other branch of rural activity we have progressed enormously since these dates; how account for retrogression in the pig industry? On all sides it is generally admitted that the blame, if any, must rest with our neglect or inability to secure a suitable export market for surplus pork. South Australian consumption is extremely limited. If, in addition to fresh pork, we take into consideration bacon and ham consumed locally, we shall find that local consumption does not exceed 70,000 carcasses annually. Hence, if we must rely upon local consumption almost exclusively, as at present we perforce must, there is certainly no incentive to expansion, indeed rather the contrary. What normally happens on our markets is that in alternate waves pigs are high or low-priced in response to the scarcity or abundance of local supplies. High prices always tempt those who have not yet been bitten to go into the business heavily, only to realise when their pigs are marketable that others have done likewise, with the result that they frequently have to sell at a dead loss. And so it goes on from season to season and from year to year, and in existing circumstances, nobody can conscientiously press the claims of the pig industry upon those able to take a hand in it.

## CONNECTION BETWEEN THE PIG INDUSTRY AND GENERAL AGRICULTURAL DEVELOPMENT.

But, as I see the question, it is not with lost opportunities of direct gain from the exploitation of pigs only that we are here concerned; unfortunately there are indirect issues of equal, if not greater import. Personally, I am of the opinion that the next general forward movement in agricultural development is likely to be very materially affected by the position of our pig industry. Indeed it is very largely in the hands of the later to make or mar the movement. To-day, over the bulk of our settled areas, land is farmed on a two or three-course rotation, yielding one crop in two or three years, somewhat on the following lines:—

1st year . . . . .	Bare fallow, or	Bare fallow
2nd year . . . . .	Wheat	Wheat
3rd year . . . . .	—	Grazing

This arrangement corresponded, no doubt, very satisfactorily to our requirements so long as large areas of relatively cheap land continued available to individual farmers. But this can hardly be said to be the case very generally to-day; slowly but surely the area of individual farms is being reduced, and examples are not wanting of

land values quite out of proportion to their producing powers under present normal methods of treatment. It is indeed questionable whether in our rainfall districts we shall be able to forego much longer in each year the use of from one-half to two-thirds of our arable areas. If we wish to continue on the land we shall find ourselves compelled to increase the gross returns of these arable areas, and, assuming adequate market conditions, it is quite possible to do so over the bulk of our farming areas by sowing a second crop on our wheat stubbles. Now, whilst as a matter of general practice, the world's experience is against making wheat follow wheat in successive years, it is all in favor of a second cereal, such as barley or oats, both of which are very much less exacting in the matter of soil preparation. A second crop would convert our present rotation into rotations of three and four courses, with two crops every three or four years, on the following lines:—

1st year . . . .	Bare fallow, or	Bare fallow
2nd year . . . .	Wheat	Wheat
3rd year . . . .	Barley or oats	Barley or oats
4th year . . . .	—	Grazing

Within recent years, the area under crop in South Australia has been slightly in excess of three million acres, with bare fallow covering an additional one and a half million acres. Barley and oats taken together, on the other hand, have barely exceeded 200,000 acres. In the circumstances, it is conceivable that if a second crop were generally adopted over our fair rainfall districts, an additional million acres, or thereabouts, might be added annually to our area under crop. Clearly this would lead to additional gross returns from our farms and to an appreciable lightening of the ever increasing burden of rising land values. According to climatic and soil conditions, oats or barley would be given preference, but to-day I am concerned mainly with barley of the Cape type which, as a second crop, can be grown successfully almost anywhere in South Australia. On farms averaging 20bush. of wheat after bare fallow, barley of this type may generally be depended upon for 30bush. when grown as a second crop on light and relatively inexpensive tillage. But here again, as in the case of pigs, we are faced with the difficulty of knowing what to do with barley once we set about producing it on a large scale. If even to-day with our odd hundred thousand acres under barley, favorable seasons and heavy crops often spell marketing difficulties, what is likely to happen if we should aspire to 1,000,000 acres? True, an overseas market might probably be found for barley. As matters stand, Great Britain absorbs the great bulk of the barley grown around the Mediterranean, and would probably take ours as well. Prices, however, are not likely to be very alluring and at times may prove unremunerative, but, fortunately again given adequate market facilities, barley can, as a rule, be marketed far more satisfactorily through pigs. Hence, in my view, the indirect connection between pigs and general agricultural development. Economic conditions urge upon us greater gross returns from our farms; we can secure these by growing barley as a second crop, but barley cannot be marketed satisfactorily except through pigs; hence, if we cannot market

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our pigs satisfactorily, the whole scheme falls to the ground and agricultural development is seriously checked.

Let me, in this connection, draw attention to some recent feeding experiments conducted at Turretfield.

#### FEEDING PIGS WITH BARLEY.

Twelve weaners, aggregating in total weight 620lbs. (an average of 51.67lbs. per head), were fed under test conditions for a period of six weeks, by the end of which time their total weight had risen to 1,154½lbs., or 96.21lbs. per head. Over this period they were supplied with the following total quantities of foodstuffs:—

Crushed barley . . . . .	37.8bush.
Abattoirs meat meal . . . . .	168lbs.
Skim milk . . . . .	924lbs.

These rations were responsible for an increase in live weight of 534½lbs., and apart from barley supplied, the cost of producing these 534½lbs. may be summarised as follows:—

168lbs. Abattoirs meat meal . . . . .	£1 8 0
924lbs. skim milk at 2d. a gallon . . . . .	0 15 5
Service, interest, &c. . . . .	0 18 0

Total cost of production of 534½lbs. of  
pork (live weight) exclusive of barley      £3 1 5

From the above data it is easy to estimate the value realised for the 37.8bush. of barley fed to the pigs. Everything, of course, depends upon ruling rates for young pork which, at the time, were in the neighborhood of 8d. per lb. The total value of 534½lbs. of pork would therefore be represented by £17 16s. 4d., and, if from this sum we subtract £3 1s. 5d. representing costs of production, exclusive of the barley, we get £14 14s. 11d. for 37.8bush. of barley, or 7s. 10d. a bushel, at a time when the current market price of barley was not much above 2s. a bushel. On these terms, feeding barley to pigs is undoubtedly profitable, but it is idle to imagine that we can always count upon securing 8d. a lb. live weight for young pork. In order, therefore, to put the position in proper perspective, I have indicated below in Table I. the prices that would have been realised for the barley fed with prices for pork varying from 2d. to 10d. a pound respectively.

TABLE I.—*Showing Calculated Values of Barley fed to Pigs at Varying Prices for Pork.*

Prices of Pork per lb. live weight.	Calculated value of 534½lbs. pork (live weight).	Per 37.8bush.	Calculated-value of barley fed.
			Per bush.
			s. d.
2d.	£4 9 1	£1 7 8	0 8½
3d.	6 13 7	3 12 2	1 11
4d.	8 18 2	5 16 9	3 1
5d.	11 2 8	8 1 3	4 3
6d.	13 7 3	10 5 10	5 5
7d.	15 11 9	12 10 4	6 7
8d.	17 16 4	14 14 11	7 10
9d.	20 0 11	16 19 6	9 0
10d.	22 5 5	19 4 0	10 2

These figures show what an enormous difference ruling prices for pork may make in values realised for barley fed to pigs. If the price is 2d. a lb., the value realised for barley is less than 9d. a bushel; of, on the other hand, the price is 10d., the value realised for barley is over 10s. a bushel. Briefly, a difference of 1d. a lb. in pork represents a difference of 1s. 2d. a bushel in barley used to produce it. An inspection of Table I. will show, I think, that so long as farmers can depend upon a minimum of 4d. a lb. live weight for their pork, it will pay them to grow barley as a second crop and feed it to pigs. And this must surely be the case when it is remembered that for a considerable period of their lives pigs should be handled mainly as grazing animals, that better than any other kind of live-stock they can convert into profitable flesh inferior grain, offal, and waste products of all sorts, and that, in many instances, barley will be required mainly for topping them up for market.





## GREAT BRITAIN'S IMPORTS OF PORK AND PIG PRODUCTS.

But we all know that, although in its spasmodic movements, the local market will frequently offer us more than 4d. a lb. live weight for pork, it will, with equal frequency, offer us less, and that it is only a large and steady export trade that could build up a pig industry capable of absorbing the grain from 1,000,000 acres of second crop. Does the world offer openings for such an export trade, or is there little or no outside demand for pigs and pig products? Again, if the demand exists, is it being supplied by countries in which wages and the standards of life are low and general economic conditions more favorable than our own? These are some of the questions which I now propose examining.

Great Britain, with its teeming manufacturing population and relatively scanty home-grown foodstuffs, is the natural market to which those who have foodstuffs for sale usually look. Let us, therefore, ascertain to what extent Great Britain is a purchaser of pork and pig products. In this connection, some allowance must be made for dislocation and anomalies in commercial relationships resulting from the action of the late war. Hence, whenever possible, side by side with the latest available figures, namely 1919, I shall show corresponding figures for the mean of the five-year period immediately preceding the war (1910-14). The position in so far as British imports of pork and pig products are concerned, has been summarised below in Table II.

TABLE II.—*Showing Quantities and Values of British Imports of Pork and Pig Products in 1919 and the Mean of the Pre-War Quinquennial Period respectively.*

Items.	1919.			Mean of 1910-14 Period.		
	Quantities.	Values.		Quantities.	Values.	
	Cwts.	Total. £	Per lb. d.	Cwts.	Total. £	Per lb. d.
Bacon . . . . .	8,281,198	73,591,919	19.04	4,664,440	15,612,932	7.17
Lard . . . . .	2,178,330	18,673,125	18.37	1,767,242	4,729,675	5.73
Ham . . . . .	1,813,154	16,089,697	19.02	853,126	2,861,180	7.19
Fresh pork . . . .	—	—	—	488,893	1,301,658	5.71
Salted pork . . . .	24,074	175,588	15.63	235,744	293,222	2.67
Frozen pork . . . .	136,189	899,975	14.16	31,317	73,820	5.05
Totals . . . . .	12,432,945	109,430,304	18.86	8,040,762	24,872,487	6.63

Table II. shows very clearly the importance of Great Britain as a market for pig products. In pre-war days the mean yearly imports were represented at over 8,000,000cwts., valued at close on 25 million sterling delivered at British ports, whilst in 1919 quantities rose to 12½ million cwts. and values to 109½ million sterling. Similarly, mean c.i.f. prices per lb. were about 7d. and 19d. respectively.

But a juster conception of the importance and magnitude of the British pork imports will be formed if we compare them with other staple imports in which as actual or potential exporters we are more or less vitally interested. From this point of view Table III., in which data concerning these imports have been summarised in order of relative values, should prove of interest.

TABLE III.—*Showing Quantities and Values of Chief British Imports in which the Commonwealth, as exporter, is interested.*

Items.	1919.	Quantities.	Values.		
			Total. £	s. d.	Per Unit.
1. Pig products . . . . .	12,433,000cwts.		109,430,000	1 7	per lb.
2. Wool . . . . .	9,312,000cwts.		96,889,000	1 10	per lb.
3. Meat, exclusive of pork . .	† cwts.		83,104,000	†	
4. Wheat . . . . .	71,443,000cwts.		68,423,000	10 3	per bush.
5. Wheaten meal and flour . .	17,711,000cwts.		25,729,000	29 1	per cwt.
6. Butter . . . . .	1,560,000cwts.		19,854,000	2 3	per lb.
7. Wines . . . . .	25,252,000galls.		18,167,000	14 5	per gall.
8. Frozen mutton . . . . .	4,075,000cwts.		17,958,000	0 9½	per lb.
9. Cheese . . . . .	2,118,000cwts.		15,171,000	1 3	per lb.
10. Oranges . . . . .	5,201,000cwts.		9,445,000	13 0	per 40 lbs.
11. Currants . . . . .	2,431,000cwts.		8,662,000	0 7½	per lb.
12. Eggs . . . . .	56,444,000doz.		8,613,000	3 1	per doz.
13. Apples . . . . .	2,967,000cwts.		6,246,000	15 0	per 40 lbs.
14. Raisins . . . . .	1,221,000cwts.		5,558,000	0 9½	per lb.
15. Dressed poultry . . . . .	148,000cwts.		1,528,000	1 10	per lb.

TABLE III.—*Showing Quantities and Values of Chief British Imports in which the Commonwealth, as exporter, is interested—continued.*

Items.	1910-14 (yearly mean).	Quantities.	Values.		
			Total £	s. d.	Per Unit.
1. Wheat . . . . .	104,534,000cwts.		43,620,000	4 6	per bush.
2. Wool . . . . .	6,986,000cwts.		33,093,000	0 10	per lb.
3. Meat, exclusive of pork . .	† cwts.		30,547,000	†	
4. Pig products . . . . .	8,041,000cwts.		24,872,000	0 6½	per lb.
5. Butter . . . . .	4,151,000cwts.		24,309,000	1 0	per lb.
6. Frozen mutton . . . . .	5,117,000cwts.		9,924,000	0 4	per lb.
7. Eggs . . . . .	191,944,000doz.		8,380,000	0 10½	per doz.
8. Cheese . . . . .	2,369,000cwts.		7,273,000	0 6½	per lb.
9. Wheaten meal and flour . .	10,451,000cwts.		5,641,000	10 10	per cwt.
10. Wines . . . . .	12,461,000galls.		4,081,000	6 6	per gall.
11. Oranges . . . . .	5,443,000cwts.		2,360,000	3 1	per 40 lbs.
12. Apples . . . . .	3,329,000cwts.		2,241,000	4 10	per 40 lbs.
13. Currants . . . . .	1,287,000cwts.		1,653,000	0 2½	per lb.
14. Raisins . . . . .	664,000cwts.		1,217,000	0 4	per lb.
15. Dressed poultry . . . . .	249,000cwts.		846,000	0 7½	per lb.

I should perhaps apologise for the array of figures in Table III.; but in my view, they are very essential to a just estimate of the position. They may serve at all events to bring home to us the importance of the position occupied by pork in the list of those British imports in which, both as a State and as agriculturists, we are specially interested. We may note that in this list of imports the total value of pig products in 1919 was in excess of that of any other commodity; and that in the pre-war period it was exceeded by the values of wheat, wool, and the aggregate total of all other meats only. In the past we have been ambitious to supply Great Britain with wheat, wool, frozen mutton, butter, wine, apples, &c., and we have succeeded in doing so with no small advantage to ourselves; in no distant future we shall be faced with heavy surpluses of currants, raisins, and other dried fruit. Shall we find exports profitable with possible c.i.f. prices

of 2½d. and 4d. respectively? It is extremely doubtful that we should be able to do so. On the other hand, we have completely neglected pork, at a time when c.i.f. prices of 7d. a lb. would certainly have proved remunerative; and should we find ourselves compelled to accept them again, I see no reason why they should not leave us an adequate margin of profit. Let us note that this price has evidently proved remunerative to British suppliers in the past, or else business could hardly have been maintained; and if remunerative to them, there is no reason why it should not prove equally remunerative to us, unless indeed their general economic position should for that purpose prove infinitely superior to our own. In this connection, therefore, it will not be without interest to ascertain who have hitherto been Britain's suppliers of pork and pig products. I have endeavored to summarise the latter in Tables IV. and V. for 1919 and 1910-14 respectively.

TABLE IV.—*Showing Great Britain's Suppliers of Pork and Pig Products in 1919.*

	Bacon.	Ham.	Fresh Pork.	Salted Pork.	Frozen Pork.	Lard.	Total.
QUANTITIES.							
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
U.S.A. . . .	5,893,514	1,718,363	—	23,083	12,207	1,833,685	9,480,852
Canada . . .	2,094,248	74,762	—	—	—	—	2,169,010
China . . .	258,271	—	—	—	4,400	158,354	421,025
Argentine .	—	—	—	400	86,800	—	87,200
Denmark .	6,644	—	—	—	—	2,302	8,946
Other countries	28,521	20,029	—	591	32,782	183,989	265,912
Totals	8,281,198	1,813,154	—	24,074	136,189	2,178,330	12,432,945
VALUES.							
	£	£	£	£	£	£	£
U.S.A. . . .	52,114,884	15,264,376	—	168,572	81,534	15,928,266	83,557,632
Canada . . .	18,880,735	653,424	—	—	—	—	19,534,159
China . . .	2,267,944	—	—	—	30,800	1,209,675	3,508,419
Argentine .	—	—	—	2,613	552,599	—	555,212
Denmark .	65,803	—	—	—	—	16,128	81,931
Other countries	262,553	171,897	—	4,403	235,042	1,519,056	2,192,951
Totals	73,591,919	16,089,697	—	175,588	899,975	18,673,125	109,430,304

Now we shall note that close on 94 per cent. of the pork and pig products imported by Great Britain in 1919 came from the United States of America and Canada, two countries in which general economic conditions are not unlike our own. Incidentally, and in the way of commercial barter, in 1919 Great Britain paid tribute to these two countries to the extent of over 103 million sterling for pork and pig products only.

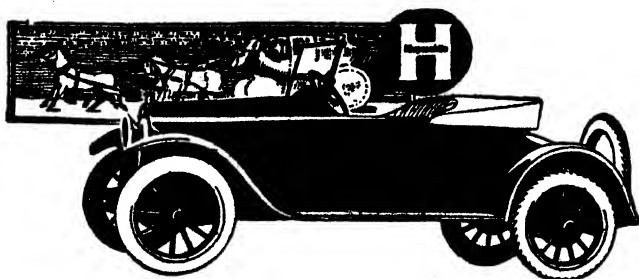
TABLE V.—*Showing Great Britain's Suppliers of Pork and Pig Products in the 1910-14 Period.*

	Bacon.	Ham.	Fresh Pork.	Salted Pork.	Frozen Pork.	Lard.	Totals.
	Cwt.	Cwt.	QUANTITIES. Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
U.S.A. . .	1,629,886	781,689	—	41,462	6,004	1,653,435	4,112,476
Denmark . .	2,256,993	2,094	11,631	186,284	—	19,283	2,476,285
Netherlands	132,566	—	455,670	—	—	15,034	603,270
Canada . .	400,190	64,701	—	1,286	—	—	466,177
Russia . . .	166,882	—	—	—	—	—	166,882
Sweden . . .	54,934	—	—	—	—	—	54,934
China . . .	—	—	—	—	15,053	10,632	25,685
Servia . . .	8,570	2,314	—	—	—	—	10,884
Belgium . .	—	—	10,113	—	—	—	10,113
France . . .	—	—	8,668	—	—	—	8,668
Germany . .	—	932	—	—	—	5,846	9,358
Other countries	14,419	1,396	2,811	6,712	10,260	66,634	102,232
Totals . .	4,664,440	853,126	488,893	235,744	31,317	1,767,242	8,040,762

TABLE V.—*Showing Great Britain's Suppliers of Pork and Pig Products in the 1910-14 Period—continued.*

	Bacon.	Ham.	Fresh Pork.	Salted Pork.	Frozen Pork.	Lard.	Totals.
	£	£	VALUES. £	£	£	£	£
U.S.A. . . .	5,172,788	2,612,414	—	99,753	15,579	4,430,010	12,330,544
Denmark . .	7,933,984	7,675	28,492	180,500	—	54,081	8,204,732
Netherlands	450,263	—	1,209,573	—	—	37,416	1,697,252
Canada . . .	1,301,348	224,329	—	3,110	—	—	1,528,787
Russia . . .	506,333	—	—	—	—	—	506,333
Sweden . . .	178,455	—	—	—	—	—	178,455
China . . .	—	—	—	—	33,343	24,729	58,072
Servia . . .	25,160	8,082	—	—	—	—	33,242
Belgium . .	—	—	28,708	—	—	—	28,708
France . . .	—	—	24,844	—	—	—	24,844
Germany . .	—	3,512	—	—	—	5,846	9,358
Other countries	44,601	5,168	10,041	9,859	24,898	177,591	272,158
Totals . .	15,612,932	2,861,180	1,301,658	293,222	73,820	4,729,673	24,872,485

Again we may note that although in pre-war days the United States and Canada did not hold the monopoly of Britain's supplies of pork, their position was still one of great importance; between the two of them they supplied 57 per cent. of Great Britain's requirements, representing a total c.i.f. value close on 14 million sterling. It is clear, therefore, that if we seek seriously to share in this important business it is not competitors with the advantage of low wages and low standards of living that we shall have to face, but the most progressive countries of the world, whose general standards are equal to, if not higher, than our own. If America could place cured pork in Great Britain advantageously at 7d. a lb., surely we could do likewise. As is well known, maize is America's staple product for fattening pigs; but as I have already pointed out, we can grow barley for the purpose quite as easily as America can grow maize and probably at less cost; and for quality in bacon barley is infinitely superior to maize.



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## THE PIG INDUSTRY IN THE UNITED STATES.

Now whilst the commercial relations with Great Britain give some indication of the immense importance of the pig industry to the United States, they are very far from revealing the whole story in so far as the latter country is concerned. And since I am sanguine that did we but bestir ourselves we should have no difficulty in emulating American achievements in this direction, I propose making closer and more intimate inquiry into the general position in that country, in the hope that the results revealed may galvanize into activity such latent powers as we certainly possess.

In the first place let us consider the relative strengths of the herds of swine in the United States, in Canada, and in the Commonwealth. For 1919 they may be summarised as follows:—

	Number of Pigs.	Pigs per 1,000 of Population.
United States . . . . .	74,584,000	709
Canada . . . . .	4,040,000	470
Commonwealth . . . . .	755,494	141
* South Australia . . . . .	60,295	129

It has been said of certain North African States, with which I am acquainted, that if a census of the donkeys in the country were to be taken, it would approximate very closely in numbers to that of the native population, and now it almost seems as if the United States will soon have a pig for every one of its inhabitants. In passing, it may be stated that here, both in the Commonwealth as a whole and in South Australia in particular, we have, even on a purely population basis, still a long way to go before attaining to figures of corresponding importance. If our pig population corresponded proportionately to that of the United States—and there is no reason why it should not be exceeded—it would amount to-day to close on 3,750,000 head for the Commonwealth and 350,000 for South Australia.

The importance and value of American exports of pork to Great Britain have already been noted. Let us now consider the quantities and American f.o.b. values of corresponding exports to the whole of the world. These have been summarised below in Table VI.:

TABLE VI.—*Showing U.S.A. Total Exports of Pork and Pig Products in 1919 and 1910-14 respectively.*

	1919.			1910-14.		
	Quantities. Cwt.	Values Total. £	Per Lb. s. d.	Quantities. Cwt.	Values Total. £	Per Lb. s. d.
Bacon . . . . .	10,627,656	93,478,307	1 3	1,634,764	4,895,346	0 6½
Lard . . . . .	6,998,739	61,427,358	1 3	4,651,015	11,729,581	0 5½
Hams and shoulders . . . . .	5,328,533	47,357,209	1 3	1,448,081	4,456,738	0 6½
Pickled pork . . . . .	304,588	2,153,130	1 0	424,789	1,028,719	0 5
Fresh pork . . . . .	239,080	2,086,889	1 3	18,215	52,304	0 6
Canned pork . . . . .	51,712	605,591	1 8	36,423	109,184	0 6½
<b>Totals . . . . .</b>	<b>23,550,308</b>	<b>207,113,484</b>	<b>—</b>	<b>8,213,287</b>	<b>22,271,872</b>	<b>—</b>

NOTE.—In the above table, dollars have been converted on a 5s. basis for 1919 figures, and at par for 1910-14 figures. All values are at f.o.b. prices in American ports.

It will be noted, in the first place, how enormously the pig industry has developed in America since pre-war days; in the matter of exports, quantities appear to have trebled and values to have increased tenfold. How important must be an industry that can, in the course of a single year, export over 200 million sterling worth of produce can readily be imagined. This sum represents, I believe, about one-tenth of the value of the total exports of the United States. We have every reason to be proud of our wool exports, but they are dwarfed when compared with American pig exports, since even the high prices of 1918-19 did not bring us more than 42½ million sterling.

In 1918, Canada with its 8,500,000 inhabitants exported pig products to the value of £15,666,000 which, on a population basis, is not far short of the figures of the United States. In the Commonwealth, on the other hand, total exports were valued at £419,000 for 1918, and in South Australia at £1,165 for 1919-20.

Finally, I have summarised in Table VII. the chief countries which have been supplied with pig products by the United States in 1919 and 1910-14 respectively:—

TABLE VII.—*Showing Principal Countries Supplied by the United States with Pork and Pig Products in 1919 and 1910-14 respectively.*

	1919.			1910-14.		
	Quantities.	Values.		Quantities.	Values.	
	Cwt.	Total. £	Per lb.	Cwt.	Total. £	Per lb.
1. United Kingdom	9,590,745	87,230,534	19½d.	4,126,611	11,337,773	6d.
2. France . . . . .	3,412,709	27,833,209	17½d.	137,415	326,238	5d.
3. Belgium . . . . .	2,498,505	21,027,723	18d.	274,817	726,770	5½d.
4. Netherlands . . . .	1,787,193	15,613,453	18½d.	592,010	1,527,920	5½d.
5. Italy . . . . .	1,038,032	8,977,422	18½d.	110,991	277,481	5½d.
6. Germany . . . . .	909,750	8,570,394	20½d.	1,371,840	3,481,026	5½d.
7. Denmark . . . . .	747,044	6,656,845	19d.	44,032	112,978	5½d.
8. Canada . . . . .	690,732	5,894,352	18½d.	269,994	764,578	6d.
9. Cuba . . . . .	694,337	5,821,820	18d.	548,415	1,444,214	5½d.
10. Mexico . . . . .	72,901	641,172	19d.	73,478	203,589	6d.
11. Newfoundland and Labrador . . . . .	58,026	404,422	19d.	67,418	157,965	5d.
12. Other countries . .	2,050,334	18,442,138	19½d.	596,266	1,911,340	7d.
Totals . . . . .	23,550,308	207,113,484	19d.	8,213,287	22,271,872	5½d.

It may be noted that American pork wares have spread far and wide, and that they have penetrated even into Denmark, which is itself a heavy exporter of similar articles.

#### SUMMARY OF POSITION.

At this stage, and before enlarging further on the matter, may I summarise the position as I have endeavored to place it before you?

Our general climatic and agricultural conditions are in every way adapted to the rearing and handling of high-class pigs; nevertheless, although in most other lines of rural activity we have expanded amazingly in recent years, both in the Commonwealth as a whole, and in South Australia in particular, the pig industry has been at a standstill for many years, if not actually on the down-grade. The sole cause of this regrettable state of affairs would appear to be the absence of any definitely established export outlet. Moreover, inasmuch as it prevents us from handling advantageously second crops of barley, which could otherwise be grown very extensively in this State, our inability to extend the pig industry may be said to bar the way to much needed agricultural development. On the other hand, this apparent inability to export is not the natural consequence of the absence of suitable overseas markets or of the competition of countries with low standards of living. Great Britain alone imports enormous quantities of foreign pork and pig products, and the great bulk of these is supplied by progressive countries in which wages and standards of living are at least equal to our own. In this connection we see a great country like the United States with an annual foreign trade exceeding 2,000 million sterling, deriving one-tenth of it from pig products alone. Hence, neither climatic, agricultural, nor economic conditions are unfavorable to the development of a great pig industry in our midst. Why is it, then, that we are not reaping the full benefit of these natural advantages? Why do we leave the exploitation of British markets to more wide awake foreign competitors?

#### THE INADEQUACY OF FROZEN PORK TOWARDS BUILDING UP A NATIONAL EXPORT INDUSTRY.

Mainly, I believe, because whilst we are sufficiently organised for production, we are very far from being so from the point of view of export. It should not be imagined that because there are eager purchasers of pork at the other end of the world, and surplus pork at this end, the mere placing of the latter on board ship to the address of the former must necessarily lead to satisfactory business. A simple procedure of this kind may possibly hold good for such staple commodities as wool, wheat, exportable fresh fruit, &c.; it may even hold good to-day in the case of frozen mutton. But if in the case of frozen mutton, why not in that of frozen pork, too? Concerning this point, I cannot pretend to reply with any degree of authority. I do know, however, that for the past 20 years, facilities for overseas shipments of frozen pork have not been wanting; that from time to time trial shipments have sailed from these shores, and notwithstanding all this, the export of frozen pork has failed to acquire any degree of national importance. Why? Perhaps I may hazard the suggestion that there never has been and never will be anything like the same demand for fresh pork as for other types of fresh meat. The proof of this statement, if needed, is given in Table VIII., in which are shown Great Britain's imports of all kinds of meat in fresh or frozen condition.



TABLE VIII.—*Showing British Imports of Fresh or Frozen Meat in 1919 and 1910-14 (Mean).*

	1919. Cwt.	1910-14 (Mean). Cwt.
Beef . . . . .	6,492,230	8,086,058
Mutton . . . . .	4,074,956	5,257,492
Rabbits . . . . .	254,875	530,457
Pork . . . . .	136,189	520,210
Unenumerated . . . . .	1,121,880	761,653
	12,080,130	15,155,870
Pork percentage . . . . .	1.13 per cent.	3.43 per cent.

Thus it will be seen that, notwithstanding the huge quantities of pork and pig products imported into Great Britain, in the fresh or frozen state, pork represented in 1919 only 1.13 per cent. of the total quantity of meat imported in similar condition, and 3.43 per cent. of that total in the five years that preceded the war. It may be noted, too, that in both periods a greater weight of fresh and frozen rabbits was imported than of fresh or frozen pork. Hence, I am of the opinion that to attempt to build up a great national export trade in pork on a purely fresh pork basis is to attempt what has very remote chances of success. I do not, of course, deny that limited quantities of fresh pork can at times be exported to advantage; this has been done occasionally in the past. The influence, however, of these exports on local production has been practically nil, and will, in my opinion, continue to be so. A back reference to Table II. will serve to emphasise the position of the British importer on this question. We can see there that in 1919, for every cwt. of frozen pork imported into Great Britain, there were corresponding imports of 74cwts. of bacon and ham, and 16cwts. of lard. Similarly, if we turn to Table VI., we shall find the experience of the United States as an exporting country to be on parallel lines; for every 1cwt. of fresh pork exported in 1919, exports of bacon and ham amounted to 67cwts., and of lard to 29cwts.

#### THE EXPORT POSITION OF BACON AND HAM.

Now, in such matter, I take it that if we wish to succeed, the golden rule is to place before customers articles they are likely to require, and not to attempt to force upon them those for which they have little or no use. If the market calls for bacon and ham, and pays well for it, where is the sense of glutting it with frozen pork? This immediately brings us up against two difficulties which are supposed locally to bar the way to success, and which I propose discussing to the extent of my information. Firstly, can we make bacon and ham of a type likely to prove acceptable to the markets of the world; and, secondly, should we be able to do so, are we in a position to ship it advantageously to Europe?

As to the first point, it is stated with a good deal of truth that as matters stand we have no export bacon in the State; and that if by good fortune a satisfactory parcel for shipment were to be brought together, we should find it quite beyond our powers to supply repeat

orders of equal quality. We may acquiesce in all this without, however, admitting that the position is beyond remedy, and, indeed, other than what might in the circumstances have been expected. It is perfectly true that local bacon and ham are very uneven in type, and frequently indifferent in quality, although even here I believe that matters have improved somewhat within recent years. For these defects curers are inclined to blame the pig raisers; but the public, with truer instinct, perhaps, lay the blame at the doors of the curers. Let us assume, if blame there be, that it admits of being divided between both parties: pig raisers do not always grow the type of pig required by the curer, nor do they always feed it on the most approved lines; and curers, on the other hand, are undoubtedly at times very remiss in their curing operations. This position is none other than what might be expected in any country in which the industry is in its infancy, and has not yet come under the rigid discipline of international competition. So soon as we enter upon the world's markets, and meet the competition of others, we shall find ourselves compelled to follow those methods only which lead to highest results. We need not flatter ourselves that there are empty spaces in these markets patiently awaiting our arrival: we shall probably have to force others out and force ourselves in. This is crudely expressed, perhaps; it is nevertheless what is happening daily in the world of barter. In our role of late-comers and intruders, our chances of success in the struggle are very remote unless we can put forward articles of the very first class, and maintain a continuously even stream of them. As to our ability to supply the type and quality of pig required, I have not the slightest uneasiness. Let the farmer or pig raiser know that thousands of pigs are wanted weekly; let him realise that prices are stable and remunerative; and let him understand the type of pig required for the export market; and it will not be long before he will produce pigs

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in requisite numbers, true to type, and true to feeding requirements. A certain amount of missionary work in this direction will, no doubt, be necessary, but, given a satisfactory outlet, I have not the slightest doubt as to its early and rapid success.

How are we to rectify manufacturing errors, and to secure absolute uniformity of type for overseas shipments? I do not wish to be understood as reflecting unduly upon local curers; in many cases they are, no doubt, filling admirably their role of local purveyors, and it is no reflection upon them to state that in present circumstances they cannot meet the requirements of a market which they have never had in contemplation. I am strongly of the opinion that a large export trade in bacon and ham cannot be built up except as the result of the action of large modern factories, so arranged as to reduce waste to a minimum, and turn to financial advantage every possible by-product; whose main aim is the export trade, and with whom local requirements are no more than a secondary consideration. It is probable that with our local lack of experience, factories of this kind could not be erected and set in adequate working order without outside foreign advice and assistance; and, in my opinion, it is to America that we should look for what we require in this direction. To forego such assistance, and try to do everything off our own bat, would certainly involve much waste of time and money, and possibly eventual failure.

As to the second difficulty—our ability to ship bacon advantageously to Europe—it would appear to be dependent mainly on the range of freight values and on the extent to which bacon can withstand the effects of a five to six weeks' voyage, portion of which will extend into the tropics. I am credibly informed that prior to the war, bacon could be shipped in cold storage to British ports for  $\frac{1}{2}$ d. per pound, a by no means prohibitive charge, it would seem. As to the near future, we are perhaps as yet too close to the turmoil and dislocation of a period of war to be able to pronounce satisfactorily as to what freight charges are likely to obtain. I can, however, see no good reason for believing that future freight charges will weigh heavier on bacon than on other commodities which we may have for disposal overseas. In other words, it appears to me that if we are still able to ship frozen mutton, apples, butter, and the like, at a reasonable profit, we should be able to do so for bacon also; and that if freight charges are likely to continue on a higher scale than in pre-war days, so also will average c.i.f. prices for produce. At the present moment (month of July) green or unsmoked Wiltshire sides can be shipped in cold storage to British ports at less than 2d. a pound, and reductions in the near future are not unlikely.

Nor have we any reason to believe that green Wiltshire sides will not carry satisfactorily in cold storage to Great Britain. They are being shipped in this condition very successfully from South Africa, and even from China; and such local shipments as have been made, have, I believe, been equally satisfactory.

## WILTSHIRE SIDES.

Here, it should perhaps be emphasised that if we wish to secure a hold on the British bacon market, it is as exporters of green Wiltshire sides that we should endeavor to do so. The curing is completed in Britain, so as to meet exactly the special requirements of local consumers. It is for these sides that the highest prices are realised; and it is these sides that are mainly supplied by Canada, Denmark, Ireland, &c. The United States, it is true, appear to have specialised in what is known as the "lard hog" which does not adapt itself to the Wiltshire side; at the same time the average prices realised for their bacon and ham appear to be below those realised for good Wiltshire sides.

If then we export our pork in Wiltshire sides—and I believe that we shall be compelled to do so—it is certain that we shall have to revise our ideas as to what a first-class pig should look like. Nowadays our best pigs are undoubtedly broad, chunky in build, lacking in length, over heavy in the jowl, far more typical of the lard hog than of a pig from which good sides of bacon might be expected. It is certain, therefore, that our breeder's eye will need correcting, and our favorite breeds of pigs changing. I find that in Canada, Denmark, and Ireland, the large "York"—more or less unknown in our midst—is almost universally acclaimed as the best possible type of pig for Wiltshire sides, either pure, or as a sire to good roomy sows of other breeds or strains. It is possible that by crossing our larger types of Berkshire sows with Tamworth boars, we might secure somewhat similar results. These, however, are niceties of the future, since, in my opinion, it is practically inevitable that the factories should come before the pigs; and, as yet, there are no factories in sight.

THE URGENT NECESSITY OF BRINGING UP-TO-DATE WELL EQUIPPED  
MODERN EXPORT FACTORIES INTO EXISTENCE.

With every other circumstance in our favor, we are faced then with the position that we have neither export factories nor pigs fit for export; what steps are most likely to lead to the development of both one and the other? Personally, I am of the opinion that factories have but to create the demand and suitable pigs will soon appear in adequate numbers; and since it is obviously useless to expect producers to produce pigs, for which there is no visible market, it appears inevitable that the factories should come first. Let us in this connection remember, that just as in anticipation of a problematic harvest the farmer makes heavy inroads into his capital for 12 or 15 months, so the foundations of a great national export trade are likely to prove costly, however great its promises of future gain, and perhaps indeed in proportion to them. Whence is the money to come? From private enterprise it will probably be suggested; but hitherto it has signally failed to interest itself in the matter, and after all, where the community as a whole is interested, why should individuals be called upon to shoulder all the risks? Direct State action may be

suggested by another school of thought; stimulation of private enterprise by another; co-operative action by yet another; and so on. All these points of view are more or less political in their incidence, and as a civil servant I am not prepared to deal with them. I may say, however, that the adoption of any one of them should, under efficient management, lead eventually to the building up in these States of one of their most flourishing and prosperous industries. All that is necessary towards this end is that the people as a whole should realise the importance of the facts I have endeavored to lay before you, and it will not be long ere one expedient or another will be successfully brought into play.

#### CONCLUSION.

I do not know whether I have succeeded in placing before you the essential facts of the case as convincingly as I could have wished. I know that I have probably overwhelmed you with figures, and can but trust that they may not have wearied you beyond measure; and, above all, whatever your personal discomfort, I trust that faulty advocacy may not tell against the objects I have mainly in view, namely, the improvement of the gross returns of your farms, and the increase in Commonwealth export of commodities which we are able to produce at a cost which does not shut us out from the markets of the world. Unless economists are woefully in the wrong, it is exports such as these that are most urgently needed in support of the national solvency. It is upon them, and such as them, that mainly depends the maintenance and improvement of our standards of living; our ability to provide suitable employment for our people; in brief, the whole fabric of the economic life of the community. Time and money fritted away in the production of commodities which can be produced at far less cost elsewhere will not help us to meet our obligations abroad; with the assistance of protective duties they will certainly meet the limited local demand, but, beyond that, there can be no expansion; no profitable surplus except in the shape of dumping elsewhere at a direct loss to the producer and the State. Bacon, as I have endeavored to show at great length, suffers from no such disabilities; and surely we shall be remiss indeed if we fail to take full advantage of all it has to offer in support of national prosperity.

And lastly, if by good luck I shall have succeeded in convincing you, in what way can you best assist in forwarding the object which we shall both have at heart? As individuals no doubt you can undertake to handle pigs on adequate scale, and you can undertake to persuade your neighbors to follow your example; but to what end? If the market is not there, how are your efforts to avail? On the other hand, both as individuals and as a representative organised body, you can throw all your influence in the direction of facilitating and hastening the establishment of suitable up-to-date export factories, and when once they are established you can undertake to see that they are kept adequately supplied with all the pigs they can market. If you can resolve earnestly on this, I have no fear as to the ultimate result.

## APPENDIX TABLES.

Table I.—Showing pigs present in South Australia, 1880-1919.

Pigs.			Pigs.			Pigs.		
1880	..	127,126	1894	..	—	1908	..	78,454
1881	..	120,718	1895	..	—	1909	..	80,410
1882	..	100,015	1896	..	59,479	1910	..	96,386
1883	..	108,714	1897	..	46,894	1911	..	93,130
1884	..	163,807	1898	..	60,132	1912	..	69,832
1885	..	—	1899	..	82,901	1913	..	64,119
1886	..	—	1900	..	89,734	1914	..	69,893
1887	..	—	1901	..	88,886	1915	..	66,237
1888	..	—	1902	..	82,777	1916	..	118,542
1889	..	106,856	1903	..	88,246	1917	..	110,353
1890	..	116,277	1904	..	111,497	1918	..	79,078
1891	..	81,948	1905	..	117,886	1919	..	60,295
1892	..	61,180	1906	..	111,240			
1893	..	86,418	1907	..	90,741			

Table II.—Commonwealth Pig Statistics.

Year.	Number of Pigs.	Export of		Export of		Total Value of Exports. £
		Bacon and Ham.	Value. £	Frozen Pork.	Value. £	
		Quantity. Cwt.		Quantity. Cwt.		
1900	950,349	—	—	—	—	—
1901	931,309	2,560	10,424	2,713	5,971	16,395
1902	777,289	1,824	8,106	5,785	14,654	22,760
1903	837,368	2,068	9,756	2,476	7,174	16,930
1904	1,062,703.	3,416	12,596	4,656	9,346	21,942
1905	1,014,853	4,394	15,262	25,214	47,596	62,858
1906	813,569	4,758	18,467	31,002	60,936	79,403
1907	745,101	3,757	17,579	12,917	28,406	45,985
1908	695,669	3,498	18,360	7,376	20,446	38,806
1909	765,137	3,605	18,979	3,523	9,318	28,297
1910	1,025,850	14,337	57,060	6,620	17,087	74,147
1911	1,110,721	20,898	74,178	14,643	33,639	107,817
1912	845,255	19,412	68,503	8,017	16,661	85,164
1913	800,505	16,669	74,718	1,912	5,259	79,977
1914	862,447	10,898	58,900	436	1,400	60,300
1915	753,693	5,275	35,278	25	108	35,386
1916	1,006,763	8,986	60,414	292	1,341	61,755
1917	1,169,365	45,259	321,635	2,344	11,915	333,550
1918	913,902	50,335	378,723	7,496	40,325	419,048

Table III.—South Australian Exports of Pig Products, 1915-1920.

Years.	Bacon and Ham.		Frozen Pork.		Total Value of Exports. £
	Quantities.	Value.	Quantities.	Values.	
	Cwt.	£	Cwt.	£	
1915-16	Nil	Nil	Nil	Nil	Nil
1916-17	0.15	1	Nil	Nil	Nil
1917-18	0.35	2	1,789	9,255	9,257
1918-19	Nil	Nil	6,739	37,300	37,300
1919-20	45.17	502	191	663	1,165

At the conclusion of the paper the following resolutions were carried:—Mr. J. W. Winch (Big Swamp) moved "That this Congress urge on the Government the necessity for taking steps to open out and organise the export trade in pork." Mr. H. Hunt (Mount Barker) seconded. At the instance of Mr. F. Tregenza (Coonalpyn),

seconded by Mr. J. Smith (Hawker), it was also resolved "That this Congress urges on the Government to make provision at the Government Produce Depot, at Port Adelaide, for the handling of pig products and to make trial shipments in order to test the markets."

### Wednesday Morning.

#### HOW TO MAKE COUNTRY LIFE MORE ATTRACTIVE WITH A VIEW TO INCREASED PRODUCTION.

Mr. W. H. Davis, of the Pinnaroo Branch, was responsible for the following paper:—

##### PROBLEMS OF PEACE.

South Australia, with the rest of the world, is now beset with great and delicate problems of peace. The financial burden is a matter of serious concern, and there are also the complicated questions of the high cost of living, the scarcity of commodities, and industrial unrest. It is only by bringing to the solution of these problems all the earnestness, energy, and intelligence possible that we can win through. The war has caused enormous wastage in men and money, and huge sums have to be spent in re-establishing devastated countries. Australia has its problems, too, and it is no use trying to believe that the shortage of commodities is confined to the Commonwealth—it is a world problem. Every country is clamoring for supplies, and the situation can only be met by facing the facts. The leading statesmen of Great Britain have stated that the remedy was increased production, and Australia can meet and remedy the tremendous difficulties by realising the necessity for hard work, more production, economy, and co-operation of all sections of the people.

So vital are the issues in this subject that a volume of material shedding enlightenment upon it would be a valuable assistance to the people to realise their opportunity of making this a great and prosperous country. We have the area, soil, climate, and rainfall conspiring to invite the seeker after profitable occupation.

##### OUR GEOGRAPHICAL POSITION.

We, who are the citizens of the Commonwealth, stand in a peculiarly hazardous position in the restless over-populated world of to-day. It will be readily seen that to-day a mere handful of population is scattered over the sea fringe of the only empty habitable continent that remains, and clinging to the sole right to populate this vast area of land, and indisposed to invite others to share with us the burden and reward. We stand, facing millions of starving Orientals, who are rapidly arming themselves with the educational resources, manufactures, and death-dealing implements of Western civilisation. In view of these facts is it not advisable for us to try and remedy some of our defects, and strive to render ourselves immune from invasion by making the best possible use of our resources? Centralisation is more prominent in Australia (in proportion to population) than in any other country in the world.

Let us look at the problem squarely. Here we have a continent of 2,880,000 square miles, populated by 5½ millions of people, and whose primary and secondary production totalled £298,669,000, and of that amount £223,408,000 was raised by the primary producers. The figures just quoted are such that we may well be proud of, but I feel sure that each can help to make them much larger and induce others to settle on the land in preference to other modes of living.

#### TOWN PLANNING.

We should make it our duty, in the interest of future generations, to recommend that the former haphazard method of expansion and lay out of towns should cease, and citizens be encouraged to have their dwellings out in the open country. Replanning of towns creates new land values in addition to the beautification, convenience, and health-giving conditions which result from it. I should like to suggest that all enclosures in our country towns should be planted with trees or shrubs, and that all roads (especially where they are similar to those in our district, and which grow little more than useless mallee for three-quarters of their width) leading out of the towns would be attractive if planted. This should not be of any great expense to any council or district, but if carried out in a manner similar to a "children's arbor day" should become one of the red-letter days of the year, and one which, no doubt, would be eagerly looked for by old and young alike. Interest and attention would, no doubt, be manifested by the growth of the trees, which would encourage citizens to take keener interest in the beautification of their towns and districts.

Attention is arrested by the shortage of dwelling-houses and the subdivision of land into building sites. Where are the people coming from to create this demand? If from abroad, is due proportion being located in the country districts? If from the rural areas, these very localities where increased population is urgently needed are being depleted of people who should stay where they are, and help to carry on the primary production of the State. Good roads and highways also go far towards contributing to the welfare and comfort of country residents. Quicker transportation means the saving of much time and money that could otherwise be spent on the farm.

#### LOCAL CENTRES.

Now! Why cannot we create local centres? As it is, there is practically one town, and everyone and everything must go to the city. Get our lands fully occupied, and local centres will no doubt soon spring up and flourish, where the surrounding residents could procure all their requirements, instead of going to the city to spend money and time. Time is the essence of the contract in all our daily doings. Browning says, "Leave time to dogs and apes, man has forever." That may be, but we now have to do with temporal things, and every hour is of the utmost value to us. The loss of time involved in our present system—or lack of system—is enormous, let alone wear and tear. A flourishing country would have important



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centres, where the disposal of produce and the acquisition of all requirements could be effected, and so create rivalry among neighboring centres. An opportunity would then be given for local talent to develop.

Jesse Collings's three acres and a cow was preached in the United Kingdom, and Mr. Cotton's 20-acre block system here, with the object of placing men on small holdings throughout the country districts, where occasional employment is obtainable, whilst their blocks provided them with other necessities. To my mind this is a better proposition than a quarter-acre block in the suburbs, making them entirely dependent on outside employment. It is said that this 20-acre block system did the "blockers" and the country good service, and lost its beneficial influence only when increased to 100 acres. Has it ever occurred to you that a couple of acres of potatoes and onions at recent prices would yield a greater return than a worker's wage earning for 10 or 12 months? Very fine theory, you say, but formidable difficulties confront us. You glut the market with produce, labor troubles, shipping combines, and a thousand other difficulties and obstacles stand in the way. True, but difficulties are made to be overcome; but faith in our own ability and determination to do things will accomplish much, and we are now on the turn of the tide.

#### SCIENCE IN AGRICULTURE.

Agronomy is a progressive science. What is well to-day is ill suited for to-morrow. Hence constant alertness and research after new ideas gives an attraction to rural pursuits. The "Let be" policy is fatal to progress. The present low level of production must be transformed into a level of efficient achievement. Scientific methods will aid, and will in due course be forced upon us by competition to enable us to keep abreast of other countries where labor is cheap and hours are not regulated. To use the words of Professor Brailsford Robertson, of Adelaide—"If one Australian is to accomplish as much as 50 Orientals in half their working day, he must bring brains to his job, and must employ every known means of increasing his efficiency. He must discover more and ever more new ways of multiplying his powers. The function of science is the multiplication of the power of man." Therefore we must be pre-eminently a scientifically trained and organised community.

For some time the use of chemical manures and the practice of dry farming methods were derided by men who were hide bound in the traditions of soil cultivation; but the adoption of the new teachings has meant the economic salvation of this State, and it is now clearly evident that, owing to the peculiarities of climates and soils, Australia, perhaps more than any other country, must look to applied science for the means whereby the problems which confront production must be solved, and outback wildernesses be made profitable. The greatest advancement in the line of scientific farming is being made, not by the man who is a farmer by birth and inheritance, but by the man who wants to be a farmer—the man who gets his knowledge first and then proceeds to apply it. There is a great movement on hand for

better farming methods, but the initiative is coming from the cities and towns and from the centres of agricultural education.

All cannot take a course at an agricultural college or university, but some must appeal to commonsense and observation for the task of producing. There are plenty of books to aid a self-made scientific producer, and these should be made available. "Brains are a nation's prime asset." Practical knowledge is a mighty thing, but when it is not backed by scientific information it is of little worth. It is little better than theoretical knowledge without practical experience. The best farmer is the one, who, having the practical experience, adds the scientific knowledge that tells him why he does things. He is then master of the situation. The next best farmer is the man who wants to be a farmer, and who begins with a foundation of scientific knowledge, then adds experience. His experience may cost him something, but it will not cost him as much as the experiments of the hit-and-miss practical farmer will cost him.

With good management many farms in South Australia would, no doubt, return a much larger profit than they do to-day; nor do we have to turn our attention to every little detail in order to make a profit. Many men have made a success of farming without a very extensive education of any kind, but undoubtedly had these same men been in possession of an education suitable to the farmer a much better result would have been attained.

We do not want the man who wears out farms, but the man who, whilst improving the farm, makes a substantial profit for himself, and by this means benefits himself and the whole of the State as well. By specialising in our work, it will thus be made more attractive and profitable.

#### EXAMPLE OF AMERICA IN AGRICULTURAL EDUCATION.

In America public high schools receive State aid for courses in agriculture, domestic economy, and farm mechanics, whilst hundreds of other high schools give instruction in similar subjects without State aid, whereas agricultural education (in elementary schools) was hardly thought of in 1897. The Department of Bureau of Agriculture in United States of America has also rendered valuable service for all classes of cultivators of the land, and by steadily pursuing its educational course, of experimenting, learning, teaching by exhibits, by bulletin, by lecture, and example, and thereby raising the level of agricultural ability throughout the Republic, and so increased the returns for a period of 10 years by 25 per cent. In our own State the Bureau and the Government is to be commended for having started "A Winter School for Farmers," and it is evident that many realise the value of such courses, and I sincerely hope that these "schools" will be continued, so that many more may avail themselves of an opportunity to attend.

#### THE FARM LIFE.

On all sides we hear of the exodus of country youths towards the cities bitterly deplored; rarely, however, do we meet with active local measures taken towards checking it. To my mind each member of

the family (or in such cases, hired labor) should have an interest (no matter how small) in the general working and success of the farm. Supposing each fancied some particular side line, such as poultry raising, gardening, pig raising, or the care of horses, sheep, or cattle, his or her interest would probably be the greater if a bonus or percentage was given on the net proceeds of sales. If the sons were given an early insight into the whole business of the farm, and made partners in the concern when old enough to appreciate the relationship, I think there would then be less inclination on their part to abandon the land for life in the city.

The hired laborer must not be regarded as a mere cog in a machine for producing wealth, but rather as an intelligent being, on whose loyal co-operation the success of an industry largely depends. Therefore he must be well and properly housed, and the conditions of living such that he can lead a healthy and comfortable life. The unrest and bitterness that exist to-day are due in no little measure to the disparity in the modes of living in the different social spheres. It is here that housing presents itself as a sociological question. Proper housing conditions help to stabilise labor, for the man who has a comfortable home is less liable to discontent. A man who is intelligent and understands the working of modern implements is worth more than a man who is without much of either, both in the saving of time and money by the skill and care in the using of tools and implements. Therefore let him know that he will have a share in the net profit you have made. Be it ever so little, it will encourage him, and he will feel that he is not working in vain.

Provision may also be made for a holiday to be given during the slack time—preferably after harvest—and one afternoon a week for recreation. The social aspect of the question also has important claims. The more we try to advance the social, happy life in our homes and on our farms the better the chance of keeping the young people on the land. The evenings might be made much brighter by making the books of a library or the daily paper available to one's employees or the members of the home.

#### FIELD TRIALS, ETC.

Many of these are now held throughout the State, but are usually made business affairs, and crowds no doubt collect from all corners of a district, so why not associate these trials with special tests of skill and dexterity in the various field operations, such as ploughing matches, drilling matches, driving competitions, &c., or even a prize for the best all-round and equipped team.

These tests of skill in farming matters would no doubt offer an incentive for each teamster to take a keener interest in his work, and so try to qualify for the coming events of the season, and in doing so the work would be better done for the employer. The Agricultural Bureau might also help by arranging social gatherings, homestead meetings, or by arranging district competitions, and offering a special prize for the best all-round farm, not necessarily for what it is worth, but to try and stimulate interest and enthusiasm.

## THE HOME.

This means much to a farm and those associated with it. The position of stables and various other outbuildings means much to those in the house, therefore it is advisable to have them a reasonable distance away, so that debris is not blown around or mud trampled up to the door or fences. Due consideration should be given to domestic conveniences, such as the water being laid on from the tank to washhouse and kitchen. It is little trouble to build the tankstand high enough to permit of water being gravitated to such points of convenience as mentioned. The kitchen might also be as well fitted and ventilated as any room in the house, as this might rightly be termed the "generator" of the farm. Reasonable hours for meals also means much to those in the home, and leaves more time for reading or recreation.

New times call for new measures, and, as the present calls for progress, and it is essential to go forward with the times, let us then demonstrate by actual illustration that country life has many advantages and many opportunities, which, if made use of, make a strong appeal for land settlement, and to encourage rural production, which is so necessary for national and economic welfare.

Mr. J. T. Beare (Carrow) said it was to be deplored that so many people were leaving their homes in the country and coming to the city to live. With the speaker he believed that an attraction would be added to country life if the roads leading to the townships were kept in better order, and trees planted on the roadsides. Mr. J. C. Catt (Mallala) heartily congratulated the writer on the very fine paper he had prepared for Congress. The 20-acre block system, as mentioned in the paper, had been one of the finest things introduced in South Australia, but the right of purchase had proved a curse. The blocks should have been let out on a perpetual lease. If that had been done the blockers would not have been able to sell the land to the large owners. He was pleased that the writer had referred to the lack of interest that many farmers showed in their sons. They should be given some tangible form of interest in the working of the holding. Mr. Hill (Bordertown) expressed appreciation at the step that the Government had taken in instituting a Short Course for Farmers at the Roseworthy Agricultural College; it was a step in the right direction. Mr. J. Smith (Hawker) also congratulated the writer on the very able paper that he had submitted to the gathering. He believed one of the most vital questions of the day to be that of decentralisation. He spoke of the need for outlets for primary produce at Port Lincoln and Port Augusta, and considered that the men in the outback districts were entitled to some of the conveniences that people living within a 20-mile radius of the city enjoyed. Mr. L. Pope (Waikerie) considered that one of the greatest helps in making country life attractive was the installation of an electric light plant in the home. He had installed a plant, and the lights throughout the house, barn, sheds, and stables had proved a very great boon.

In addition to the convenience of the lighting, one was able to lessen very considerably the household duties of the women folk by harnessing the electricity to the churn, washing machine, and separator. A delegate from Williamstown said their Branch was inaugurated 12 months ago with nine members. At the present time they had 70 members on the roll, which was, he thought, exceptionally good progress for a Branch to make during the first year of its existence. If the Bureau was run on proper lines, he believed there was much good to be obtained from it. They were endeavoring to make their Branch a high school for the young men of the Williamstown district. Mr. J. Gerke (North Bundaleer) spoke of the exceptionally bad state of some of the roads in the country. The roads were in such a condition that it was not safe for members to travel over them at night, and that in no small way prevented many members from attending the meetings of their Branches. Mr. A. G. Jarvis (Berri) said Mr. Davis was to be complimented on the splendid paper he had contributed to the Congress. He believed the subject of how to make farm life more attractive was one that should be seriously discussed by every Branch. The previous speaker had spoken of the bad roads preventing members from attending the meetings of their Branches. He was afraid that could hardly be taken as a good excuse. Bad roads would not prevent the young people from attending a dance, even if the distance to the township was 20 miles.

#### FARM SANITATION.

The following paper was read by Lieut.-Col. W. Ramsay Smith, M.D., D.Sc., F.R.S. (Edin.), Permanent Head of the Department of Public Health of South Australia:—

Fifty-two years ago the State of Massachusetts began serious sanitary administration by founding a State Board of Health, "the first in the country in point of time." Its charter was comprehensive—"The board shall take cognisance of the interests of the life and health of the citizens of this Commonwealth."

One of the first undertakings was to make an inquiry by practical methods into the "deleterious influences which prey upon the health of civilized man." Farm life and farm health formed the subject of the inquiry, and not a single known phase of this subject, material, mental, or moral, was neglected. The methods and results of the inquiry furnish facts for all time and for all places. The most potent and most widespread cause was discovered where it had been least expected.

In 1821 William Cobbett made journeys throughout England, and published his observations in a book, "Rural Rides." The conditions then existing on farms and among farm hands were deplorable. Following this, the health problems among the laboring classes were studied by a few reformers—scientific men, philanthropists, and moralists; men like Chadwick, Canon Kingsley, Professor Alexander Bain.

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In 1787 Arthur Young, an Englishman, travelled through France, and five years later he published accounts of his observations regarding the rural conditions in "Travels in France and Italy."

Let me say here that the world's history to date has shown that, with the exception of some small commercial communities, the welfare, the integrity, the very existence of a State, Commonwealth, Empire, or race has depended more on its rural than on its urban population; not so much on the work and wealth of its cities as on the character of its man and of its woman on the land. What were the most powerful factors that led to the downfall of the Roman Empire? They were the ruin of the small farmer by the laws regarding borrowing, credit, and forfeiture; difficulties of transport; the importations into Italy of cheap corn from Sicily where it was grown by slave labor, and the distribution of this corn to dwellers in the cities; the buying out of small holders by people who had become rich by the spoiling of conquered provinces; the management of large tracts of grazing country by capitalists with the help of slave labor; and the failure of the attempt to populate the land by returned soldiers, who said country life was too slow for them, and who consequently gravitated into the cities.

Abraham Cowley (1668) said that the antiquity of the husbandman's art is certainly not to be contested by any other. "The three first men in the world were a gardener, a ploughman, and a grazier; and if any man object that the second of these was a murderer, I desire he would consider, that as soon as he was so, he quitted our profession, and turned builder." Read Cowley's *Essay on Agriculture*, read all his essays, think of recent world-events in their light, and consider whereon our hopes for existence, mutual usefulness, and world's worth have to be founded if not on the rural population. Clinch his arguments, if need be, from Horace and Virgil and from the institutes of Vishnu, the laws of Gautama, and the books of Moses—books which set forth religious systems, with their combinations of moral law, sanitary observances, and property rights.

Landed property has charms of its own, even if it is only a house and garden, or one without the other. Horace could say—

O my dear homestead in the country! When  
Shall I behold your pleasant face again?

Of course, we have to remember that this desire of possession may charm us into covetousness—witness the story of Naboth's vineyard, or Horace again—

Oh, might that nook  
Which spoils my field be mine by hook or crook!

The observations of William Cobbett in England, and the accounts given of conditions in France by Arthur Young, will be misunderstood unless we remember that in France there was a system of peasant proprietors, whereas in England there was an institution of landlords and tenants, which afterwards gave rise to such questions as "who owns the land, and by what legal title or moral right?" You may know about the common lands of English villages and towns, and how these were the pasturing grounds for those peasants who were rich enough



to possess a cow. If you or I were to take a cow from the common, the act would be called simply stealing. If some needy aristocrat or enthusiastic patriot managed his dealings so as to take away the common from the cow, this act would be characterised as an appropriation without a title. The consequences in the two instances were not of the same nature.

Ownership in France explained much regarding the happy and contented condition of the French peasantry. The conditions in Great Britain and the effect on the peasantry there, morally, mentally, and physically, can hardly be realised by us here and now. Goldsmith's "Deserted Village" to most readers is mere poetry, Kingsley's "Alton Locke" an imaginative novel, and the report of the Crofters' Commission in Scotland only a Parliamentary paper. But we ought to realise that almost everyone of us in this State may become a landowner, and that what we do by improving our own property tells first on our own material and moral wellbeing, our wealth, and our health. For "wealth" means "weal, wellbeing, happiness, joy;" and "health" means "being whole or sound," bodily and mentally. Health and wealth are one etymologically and materially. The Roman ideal, "*Mens sana in corpore sano*," is best translated "A healthy body and a mind at ease"—in one word "sanity" or "sanitation."

To many people the word sanitation suggests smells. If it does, the smells it suggests should be odors of the ploughed field, the brier, the new-mown hay, fresh milk—of Nature's health and health-giving conditions; not putridities that signify man's carelessness, and suggest painful or loathsome diseases due to such carelessness. When, therefore, I speak to you on the subject of sanitation, or knowledge applied to health, I shall not ask you to listen to tirades on diseases or dissertations on germs. I aim at giving you some idea of what health means, and how we can keep it or regain it.

"Health," says an old English writer, "is that which makes your meat and drink both savory and pleasant, else Nature's injunction of eating and drinking were a hard task and slavish custom. Health is that which makes your bed easy and your sleep refreshing; that revives your strength with the rising sun, and makes you cheerful at the light of another day; 'tis that which fills up the hollow and uneven places of your carcass, and makes your body plump and comely; 'tis that which dresseth you up in Nature's richest attire, and adorns your face with her choicest colors. 'Tis that which makes exercise a sport, and walking abroad the enjoyment of your liberty. 'Tis that which makes fertile and increaseth the natural endowments of your mind, and preserves them long from decay, makes your wit acute and your memory retentive. 'Tis that which supports the fragility of a corruptible body, and preserves the verdure, vigor, and beauty of youth. 'Tis that which makes the soul take delight in her mansion, sporting herself at the casements of your eyes."

After spending seven years in studying the conditions affecting country places in this State, I wrote a pamphlet on the subject of "Sanitation in Country Places, including the Bacteriolytic or Septic Tank System." In it I dealt with the general subject of country life, somewhat after the manner in which I now wish to present it to you.

I emphasized the fact that good sanitation was possible only in the country, and I gave some details of our experience down to the year 1905. Since then, five more editions of that pamphlet have been issued, the last one a few months ago, summing up our experience of over 21 years of sanitary (*i.e.*, health) experiments, experiences, and results in this State.

I shall touch briefly on several of the essentials of life. Firstly: air. This is the most necessary condition of human life. Without it a man must die in a few minutes. If you are in doubt just put a man under water and note the result. Until recent years it was believed, and the belief was acted upon, that the chief factor to be considered in study and practice was the presence of carbonic acid gas in the air. After a time it was found that this gas was objectionable not so much because of its own nature, as on account of the bad company it kept; it was associated with injurious substances. In quite recent times it has been found that what counts is not so much the air we breathe into our lungs, as the air in which our skin is living; and this discovery has reformed all our notions of ventilation.

About seven years ago a pressman interviewed me on this subject, and I ventured to say that ladies who had adopted a dress that was open-necked, loose-sleeved, if sleeved at all, and who employed other means of keeping the body in a constant bath of fresh air, would never depart from them. My interviewer said: "Won't they? I thought you knew women better than that. They'll follow another fashion directly it comes along, if it chokes them." Seven years, however, is a long time for a fashion to last if it is not going to stay. It seems that, for once, fashion is to go hand in hand with science and commonsense.

Sleeping-out is another fashion which has come to stay with many—in fact, the "open-air life," night and day, is the ideal, and is not difficult to follow. Usually it needs some rather severe or troublesome sickness to lead one to adopt it. No doubt you have heard the saying, "Night air is bad." That is true—last night's air, none other. Again it has been said, "There is no bad air in the country; the farmers bottle it all up in their bedrooms." That saying came, I believe, from America and has no application here.

After air, comes water. Our State reticulation system has greatly increased in area of late years; and our water supplies, as was found out 17 years ago, are not likely to be contaminated either through the catchment areas, reservoirs, or mains. Where rain water forms the domestic supply, it may be easily made harmless by boiling or by filtering with even the most approved filter. A filter, if rightly installed, requires little attention. Once in some weeks or months it will need a candle cleaned; and a candle may last for 10 years or more. But accurate knowledge of "how to do it" is essential; and I speak from facts. This subject of filters is often misunderstood, because people do not understand the difference between mechanical and biological filtration.

Next is food. From the health point of view, food should be pure, free from all but the least harmful preservatives, such as salt, sugar, boiling; and it should be kept from contamination, especially from contact with flies and dust. The fly problem will be solved if the regulations are observed with respect to the keeping of animals.

Waste products. The great problem of civilised life is how to get rid of waste products—how to make them useful instead of harmful, to treat them as friends instead of foes. I have said elsewhere: "The sanitary apparatus required for use in the country is summed up in two words—fire and soil; the methods are strong burning and light burying"—i.e., burying organic matter in mould, not in the subsoil. In respect to the waste products of the human body, I have said: "If people only spent one-tenth of the time attending to the excretory functions that they do to procuring and preparing their food, they would be much healthier." I would add that they would abolish the quack doctor and the patent-pill maker. For excreta, a dry-earth closet near the house, with a well-made, ever-dry footpath to it, may be used. Details of this sort of structure, and directions regarding its management, have been spread broadcast throughout the State. But where water is available, either from a reticulation system or from house catchment or other source, a household may have, at small cost, all the necessities and even most of the luxuries of life in respect to closets and baths. I think, therefore, that I should no longer be silent on the subject of what has been accomplished by study and practice in this State in respect to the bacteriolytic or septic tank system.

The types in use here have been evolved during a period of 19 years of experimental study of varying conditions of locality, and numerous varieties of structure. An outline of the history of this is given in the sixth edition of "Sanitation in Country Places." Recently much interest has been aroused in the subject in the United States, especially in connection with investigations and experiments by various State Health Departments, architects, sanitary engineers, and others, to solve some of the important problems of sewage disposal in country places. Some time ago a committee of the American Public Health Association was appointed to make investigations, and that committee has issued two very comprehensive reports. The chairman of it, in writing to me recently regarding our experiences here, which he had inquired about, says:—"The uniformly good results with your simple type of tank is particularly interesting. In this country, experience with septic tanks has been varied. As you know, there have been numerous cases where scum and odors have been troublesome in both septic and Imhoff tanks, apparently due to strong, fresh, domestic sewage, or to an excess of grease and soaps. The reinforced concrete tank you refer to looks like a very good device for single houses."

The Professor of Agricultural Physics in the Department of Agriculture in the Minnesota University writes:—"I wish to thank you very kindly for sending me the bulletins on 'Sewage Disposal Systems.' I have been very much interested in this line of work. Your bulletin has given me some very desirable material. It is much

different from many others, because of the exact experience that you relate in it. Most bulletins give plenty of theory, but few facts." He goes on to discuss many details of comparison between the results obtained there and here, and the possible explanations from the point of view of difference in local conditions.

These are specimens of numerous communications from American authorities on this subject. Requests for publications describing our system have come from all quarters and from numerous sorts of bodies interested—State health authorities, municipalities, scientific and medical journals, engineers in numerous branches, professors and lecturers in universities and agricultural colleges, officers of health, district councils, publicity officers, public libraries, public affairs information services, libraries of universities and colleges, social service societies, professors of bacteriology and preventive medicine, the League of Red Cross Societies, Geneva, town planning authorities, and such like.

In our own State the position is this. There are nearly 3,000 tanks in use. Some of them have been working absolutely untouched for over 15 years. They have been and are being installed at private houses, public schools, public halls, recreation grounds, hospitals, mines, railway stations, soldiers' settlements, banks, hotels—43 per cent. of country hotels now possess them. Probably the chief safeguards of success have been the Central Board of Health regulations regarding the submitting of plans and the inspection by the board's officers before a permit to use the tank is granted. The expense of an installation is very little; the "maintenance" in almost every case is nil.

I must give a note of warning against expensive and unsatisfactory installations which are sometimes recommended and which cast discredit on the system. Information on all points is readily given on application to the department.

The experience of other countries tends to impress on us the necessity for systematic and effective supervision over the plans and construction of tanks. I find that recently Mr. Emerson, Chief Engineer of Harrisburg, in the course of a discussion on a communication read at an Instruction Camp, said that sometimes plans that might be said to be typical fell into the hands of people who did not understand them and that someone might obtain one, use it as a guide for an installation, and find that the tank did not work—consequently the medical inspector or the Health Department was the first to be condemned. "This," said Mr. Emerson, "is why we have hesitated to put out typical plans, but we do want to give you advice in any particular case."

In many things people act on the principle that half a loaf is better than no bread. But when from this they reason that half a chronometer is better than no watch, or half a tank better than no pit, then it is time to enter a caution. A good many years ago Israel Zangwill told a story of Peterkin's Pudding, and it may have been forgotten, or never heard. It is worth repeating. You never heard of Peterkin's pudding, by the way, but there is a fine moral baked

in it. Johannes came to his wife one day and said, "Liebe Gretchen, could you not make me a pudding such as Peterkin is always boasting his wife makes him? I am dying of envy to taste it. Every time he talks of it my chops water." "It is not impossible, I could make you one," said Gretchen good naturedly; "I will go and ask Frau Peterkin how she makes it." When Johannes returned that evening from the workshop, where Peterkin had been raving more than ever over his wife's pudding, Gretchen said gleefully, "I have been to Frau Peterkin; she has a good heart, and she gave me the whole recipe for Peterkin's pudding." Johannes rubbed his hands, and his mouth watered already in anticipation. "It is made with raisins," began Gretchen. Johannes's jaw fell. "We can scarcely afford raisins," he interrupted; "couldn't you manage without raisins?" Oh, I daresay," said Gretchen doubtfully. "There is also candied lemon peel." Johannes whistled. "Ach, we can't run to that," he said. "No, indeed!" assented Gretchen, but we must have suet and yeast." "I don't see the necessity" quoth Johannes. "A good cook like you"—here he gave her a sounding kiss—"can get along without such trifles as those." "Well, I will try," said Gretchen as cheerfully as she could; and so next morning Johannes went to work light-hearted and gay. When he returned home, lo! the long desired dainty stood on the supper-table, beautifully brown. He ran to

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embrace his wife in gratitude and joy; then he tremblingly broke off a hunch of pudding and took a huge bit. His wife, anxiously watching his face, saw it assume a look of perplexity, followed by one of disgust. Johannes gave a great snort of contempt. "Lieber Gott!" he cried, "and this is what Peterkin is always bragging about!"

By the use of the tank system any private house where water is, or can be made, available—and the amount required is relatively small—can have closet, bathroom, and all other sanitary appliances of the same standard as in any city in the Commonwealth or elsewhere, and under the same conditions of efficiency and cost of upkeep. No one can estimate what a modern system of closet and bathroom means in human wellbeing until it has been habitually used. Some would say it counts for even more than does the kitchen as contributing to health. And it has been said, "The first wealth is health;" and again, "There is no wealth but health." Or, as I have already said, "Health and wealth are one."

On the motion of Mr. F. H. Basey (Renmark), seconded by Mr. J. T. Beare (Carrow), a very hearty vote of thanks was accorded to Dr. Ramsay Smith for the interesting and instructive paper he had given to the Congress.

#### FREE PARLIAMENT.

*Inspector of Apiaries.*—Mr. P. J. Curnow (Wirrabara) moved—"That this Congress urges upon the Government the urgent necessity for introducing an up-to-date Apiaries Act, such Act to provide for, among other things, the registration of apiaries." The Williamstown Branch were also responsible for the following motion—"That this Congress recommends that the Government appoint an Inspector of Apiaries." The motion was seconded by Mr. G. Bain (Williamstown) and carried. Messrs. A. Stevens (Mount Barker), J. C. Catt (Mallala), Capt. S. A. White (member of the Advisory Board of Agriculture), J. W. Winch (Big Swamp), and Mrs. Wakeham (Riverton Women's) also spoke in favor of the resolution.

*Carbon Copies of Weights of Wheat.*—Acting on behalf of the Taplan Branch, Mr. A. Hammond moved—"That this Congress urges the Government to compel wheat merchants to supply farmers with carbon copies of the weights of individual bags of wheat delivered." The resolution was seconded by Mr. P. R. Hodge (Taplan), supported by J. Darley (Narridy), and carried.

*Experimental Farm on the Murray.*—On the motion of Mr. A. E. Walker (Pompoota), seconded by Mr. G. H. Brinsley (Younghusband), it was resolved—"That the Government be urged to start an experimental farm on the reclaimed areas of the Murray, with the following provisos:—(a) That the site be not selected from a choice portion of the swamp, and (b) to experiment in the treatment of inferior classes of soils and fodder crops." The motion was carried.

*Government Assistance in Improving Dairy Herds.*—Mr. A. E. Walker, a delegate from the Pompoota Branch, moved—"That this

Congress impress on the Government the necessity for breeding high-class dairy stock and assisting settlers to improve their dairy herds." Mr. G. H. Brinsley (Younghusband) seconded. The motion was lost.

*Veterinary Surgeon for Outlying Districts.*—The following resolution was moved by Mr. E. H. Parsons (Pinnaroo)—"That the Government be requested to appoint veterinary surgeons for outlying districts, including Eyre Peninsula," The motion was seconded by Mr. T. Gardner (Koppio) and carried. Messrs. Schultz (Koppio), Butler (Butler), Smith (Big Swamp), and Schultz (Petina) spoke in favor of the resolution.

*Horticultural Instructor for the Murray.*—One of the delegates from the Winkie Branch moved, and Mr. F. H. Basey (Renmark) seconded—"That this Congress requests the Government to adopt Mr. G. Quinn's suggestion, that an itinerary horticultural instructor be appointed." The motion was carried.

*1922 Winter Short Course for Farmers.*—The resolution, "That this Congress recommends that the Winter School held at Roseworthy should be repeated during the year 1922," was moved by Mr. H. Schunke (Mintaro) and seconded by Mr. H. Norseworthy (Inman Valley). The motion was carried.

*Buying Wheat by Fixed Grades.*—Mr. T. Gardner (Koppio) moved—"That, in the opinion of this Congress, it is desirable that the present system of buying wheat on the f.a.q. basis be abolished, and a system of permanently fixed grades be substituted." The motion was lost.

*Enforcement of Personal Residence Clause.*—Acting on behalf of the Ki Ki Branch, Mr. T. Cooley moved, and a delegate from the Nunkeri and Yurgo Branch seconded—"That this Congress recommends that the Government should strictly enforce the personal residence clause in leases." The resolution was carried.

*Afforestation on the River Murray.*—Mr. F. H. Basey (Renmark) moved and Mr. Pope (Waikerie) seconded—"That steps should be taken to preserve the timber growing on the bends of the River Murray, and that the Forestry Subcommittee of the Advisory Board of Agriculture be authorised by the Government to visit the river and report." The motion was supported by Capt. White, Messrs. Catt, Savage, and Howlett, and carried.

*Imperial Preference for Colonial Dried Fruit.*—On the motion of Mr. F. H. Basey (Renmark), seconded by Mr. P. M. Wilksch (Berri), it was decided "That steps should be taken to secure Imperial preference for dried fruits." The motion was carried.

*Visit of Departmental Officers to Eyre Peninsula.*—Mr. Howard, a delegate from the Petina Branch, moved—"That this Congress expresses its regret that the Government did not arrange for the Superintendent of Experimental Works, the Secretary of the Advisory Board of Agriculture, and a veterinary surgeon to visit Branches of the Agricultural Bureau on Eyre Peninsula during the past year as requested, and desires that a visit be made during the coming year." Mr. W. Schultz (Petina) seconded, and the motion was carried.

## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on January 1st, 1922:—

**BUTTER.**—Unfortunately the latest cable advices from London do not indicate an improvement in the butter market there, but rather the reverse, and until values have become stabilised, doubt would exist as to exactly what prices are likely to obtain for consignments going forward. Owing to the depressed state of the London butter market values here eased during the month, and lower grades have been meeting with only dragging sales throughout the period. At close of month rates were:—First grade to choicest factory and creamery butter in bulk, 10½d. to 11d.; second grades, 7d.; third grades, 6d.; prints and delivery, ½d. extra; best separators and dairies, 9d. to 10½d.; fair quality, 8d. to 8½d.; well-conditioned lots, 8d. to 8½d.; off-conditioned lots, 7d. to 7½d.

**EGGS.**—As was only expected, the demand was exceedingly brisk throughout December, owing to the pastrycooks and others operating strongly for their Christmas requirements, and values firmed up, but eased again when demand was filled. At the close of the month eggs were selling at the same rate as at the opening, fresh hen going out at 10d.; duck, 10½d.

**CHEESE.**—The quantities that have been marketed during the month have been probably a record, but the floors have been kept fairly well cleared throughout, the lower prices stimulating the demand in a marked degree, whilst shipments to London have also tended in this direction. At end of period rates were 5½d. to 6½d. for large to loaf.

**HONEY.**—Supplies have kept up well, and for really good lines the demand was brisk, whilst also there has been some better inquiry for second grades. At close of month values were 3d. to 3½d. for prime clear extracted; second grades, 2d. Beeswax, 1s. 8d.

**ALMONDS.**—There is very little doing in this line, and buyers had difficulty in obtaining all that they required. Until the new crop is marketed the shortage is likely to continue. At close of period prices were:—Brandis, 13½d.; mixed softshells, 12½d.; hardshells, 6d.; kernels, 2s. 4½d.

**BACON.**—As usual for the Christmas month, the call was heavier than for the preceding months, hams in particular coming in for nice request. At end of period values were:—Best factory cured sides, 1s. 1d. to 1s. 2d.; hams, 1s. 5d. to 1s. 6d.; lard, in packets 8½d., bulk 8d.

**LIVE POULTRY.**—The number of birds marketed during the month probably constituted a record, and it necessitated our holding sales daily during the latter weeks of December. Prices were good, especially for well-conditioned stock. At close of month rates were:—Prime roosters, 5s. to 7s.; nice-conditioned cockerels, 4s. to 4s. 11d.; plump hens, 3s. 3d. to 5s.; medium hens, 2s. 3d. to 3s.; ducks, good quality, 5s. to 7s. 6d.; fair quality, 3s. to 4s. 9d.; geese, worth 6s. 6d. to 9s. 3d.; turkeys, prime conditioned, 1s. 3d. to 1s. 8d. per lb. live weight; fair conditioned, 11d. to 1s. 1d. per lb.; fattening sorts lower; pigeons, 7d. each.

**POTATOES.**—Call for these kept up well throughout the month, buyers' requirements being supplied from local growers, Koroit, and Western Australia, whilst a few trucks of Gambiers were also marketed at the latter end of the month. Prices eased after the holiday demand, and values at close of month were from 9s. to 11s. per cwt. on trucks, Mile End; old from 6s. 6d. to 7s. 6d.

**ONIONS.**—New white, 6s. 6d. to 7s. 6d. per cwt. on rails.



## THE AGRICULTURAL OUTLOOK.

### REPORTS FOR THE MONTH OF DECEMBER.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective managers:—

**Booborowie.**—Weather—On the whole the weather has been decidedly cool, with occasional thunderstorms. Much delay has been caused in harvest operations owing to cool and wet weather. Crops—Generally speaking, the crops are disappointing. The grain is all more or less pinched and rather light. Crops that will yield over 30 bush. per acre this year will be exceptionally heavy for this year. Natural feed is abundant, and there will very soon be stubble paddocks available. Stock are all in good condition. Pests—Rabbits are numerous in places. Miscellaneous—The lucerne fields are not making the luxurious growth that is often noticed at this time of the year. With fine weather harvest operations should be finalised by the end of the first week in January.

**Kybybolite.**—Weather has not been summery at all, only one or two really warm days being noted; 1½ in. rain were recorded early in month; since then it has been fine, with mostly southerly breezes. Crops—Good conditions for hay carting have been experienced. A lot of the hay has been well bleached, consequently it is weighing light. Grain crops are ripe, and harvesting has commenced. Turnip crops have made very fine growth; also lucerne and maize have benefited much by late rains. Natural feed is still fairly plentiful. Pests—Caterpillars have ceased to do much more harm in the district; many oat crops were ruined by them.

**Turretfield.**—Weather—The weather during this month has been unseasonable; heavy thunderstorms, damp, dewy mornings, and cool days have been general; 156 points of rain have fallen. Crops—The bulk of the crops have been cut for hay, and some bulky yields have been taken off; the greater proportion of hay is weighing light. Wheat yields are lower than the appearance of the crops suggested. Some barley crops have been badly damaged, and the yields lessened by the storms. Stock are keeping up in condition, but the low price of butter is deterring some farmers from feeding their cows. Pests—Grasshoppers have been numerous, but have done but little damage. Miscellaneous—The vineyards look well this year, and show the benefit received from several cultivations.

**Veitch.**—Weather—We have experienced exceptionally cool weather for December. Rainfall, 30 points; average for same month, 83 points. Crops are harvesting well and sample is better than expected. Yields in some cases are not up to crop appearance. Natural Feed—Enough to keep stock going. Stock—All in healthy condition. Pests—Rabbits have done a lot of damage to crops. Miscellaneous—Wheat is being consigned away from this district to catch early market.

## 60% PHOSPHATES

finely ground will greatly benefit your fruit trees or vines.

90s. per ton on trucks, Port Adelaide.

## “CRUSADER” PETROL

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MANUFACTURER and IMPORTER.

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of December, 1921, also the average precipitation to the end of December, and the average annual rainfall.

Station.	For Dec., 1921.	To end Dec., 1921.	A'v'ge. Annual Rainfall	Station.	For Dec., 1921.	To end Dec., 1921.	A'v'ge. Annual Rainfall
FAR NORTH AND UPPER WORTH.				LOWER NORTH—continued.			
Oodnadatta .....	0.79	7.61	4.83	Spalding .....	0.52	21.81	20.33
Marree .....	1.96	7.24	6.10	Gulnare .....	0.22	21.25	19.23
Farina .....	0.42	6.56	6.73	Yacka .....	0.82	20.07	15.34
Copley .....	1.98	10.31	8.45	Koolunga .....	0.29	19.09	15.79
Beltana .....	1.95	11.06	9.01	Snowtown .....	0.27	20.11	15.95
Blinman .....	1.34	12.70	12.62	Brinkworth .....	0.47	18.78	16.16
Tarcoola .....	0.50	13.76	7.59	Blyth .....	2.85	25.44	16.75
Hookina .....	0.50	17.57	13.30	Clare .....	3.06	30.02	24.51
Hawker .....	0.54	21.28	12.72	Mintaro .....	1.16	27.62	23.26
Wilson .....	0.09	20.14	12.33	Watervale .....	1.61	28.66	27.41
Gordon .....	0.14	24.23	11.05	Auburn .....	0.86	27.08	24.25
Quorn .....	0.37	23.98	14.00	Hoyleton .....	0.64	19.90	17.79
Port Augusta .....	0.27	18.47	9.54	Balaklava .....	0.28	17.63	15.87
Port Augusta West .....	0.08	17.69	9.53	Port Wakefield .....	0.25	18.17	13.19
Bruce .....	1.21	19.09	10.40	Terowie .....	0.28	18.02	13.67
Hammond .....	1.35	21.13	11.61	Yarcowie .....	0.35	19.38	14.06
Willmington .....	0.76	29.73	18.17	Hallett .....	0.42	20.17	16.37
Willowie .....	1.05	18.64	12.16	Mount Bryan .....	1.14	22.38	16.54
Melrose .....	0.78	33.19	23.21	Burra .....	1.53	23.97	17.96
Booleroo Centre .....	0.62	20.89	15.53	Farrell's Flat .....	0.60	21.93	18.90
Port Germein .....	0.30	18.07	12.79	WEST OF MURRAY RANGE.			
Wirrbarra .....	1.50	29.92	19.62	Manoora .....	1.70	23.15	18.63
Appila .....	0.45	16.59	14.98	Saddleworth .....	1.26	22.07	19.70
Cradock .....	0.67	21.79	11.18	Marrabel .....	1.32	24.44	19.55
Carrieton .....	1.66	23.51	12.63	Riverton .....	0.92	22.71	20.66
Johnburg .....	1.84	24.33	10.50	Tarlee .....	0.66	19.74	17.75
Eurelia .....	0.79	21.24	13.36	Stockport .....	0.59	21.54	16.34
Orroroo .....	0.69	22.50	13.57	Hamley Bridge .....	0.64	19.46	16.45
Nackara .....	Nil	19.66	11.33	Kapunda .....	1.40	22.70	19.80
Black Rock .....	0.39	22.37	12.51	Freeling .....	2.03	20.70	17.82
Ucolta .....	0.20	14.68	11.90	Greenock .....	1.03	23.35	21.56
Peterborough .....	0.55	17.47	13.43	Truro .....	0.76	24.68	20.07
Yongala .....	1.10	18.75	14.41	Stockwell .....	0.78	22.12	20.24
LOWER NORTH-EAST.				Nuriootpa .....	0.77	22.22	20.94
Yunta .....	0.13	14.78	8.75	Angaston .....	0.87	24.04	22.44
Waukaringa .....	Nil	15.01	8.41	Tanunda .....	0.86	23.83	22.17
Mannahill .....	0.36	16.93	8.54	Lyndoch .....	0.92	25.07	22.81
Cookburn .....	2.50	14.61	8.22	Williamstown .....	0.85	25.57	27.52
Broken Hill, N.S.W. .....	0.29	15.63	9.91	ADELAIDE PLAINS.			
LOWER NORTH.				Mallala .....	0.37	19.66	16.56
Port Pirie .....	0.13	21.84	13.36	Roseworthy .....	0.67	18.05	17.27
Port Broughton .....	0.25	17.80	14.18	Gawler .....	0.92	19.70	19.08
Bute .....	0.62	21.14	15.65	Two Wells .....	0.45	15.17	15.85
Laura .....	0.24	22.39	18.16	Virginia .....	0.60	16.74	17.32
Caltowie .....	0.53	22.36	17.07	Smithfield .....	0.24	17.34	17.15
Jamestown .....	1.60	24.17	17.74	Salisbury .....	0.44	16.94	18.49
Bundaleer W. Wks. .....	0.42	21.51	17.89	North Adelaide .....	0.51	26.98	22.09
Gladstone .....	0.26	20.44	16.13	Adelaide .....	0.50	22.64	21.03
Crystal Brook .....	0.92	22.97	15.74	Glenselg .....	0.39	18.28	18.37
Georgetown .....	0.12	21.28	18.44	Brighton .....	0.58	23.90	21.24
Narridy .....	0.03	17.34	16.41	Mitcham .....	1.19	28.96	23.92
Redhill .....	0.24	24.40	16.75	Glen Osmond .....	1.26	26.94	25.74
				Magill .....	0.82	24.14	25.27

## RAINFALL—continued.

Station.	For Dec., 1921.	To end Dec., 1921.	A'v'g. Annual Rainfall	Station.	For Dec., 1921.	To end Dec., 1921.	A'v'g. Annual Rainfall
MOUNT LOFTY RANGES.				WEST OF SPENCER'S GULF—continued.			
Teatree Gully .....	0.93	25.01	27.77	Port Lincoln .....	0.35	18.15	19.75
Stirling West .....	2.29	45.53	46.62	Tumby .....	0.34	16.74	14.62
Uraidla .....	2.01	39.59	44.66	Carrow .....	0.19	16.76	14.64
Clarendon .....	0.91	32.74	32.98	Arno Bay .....	0.32	16.02	13.08
Morphett Vale .....	0.52	23.73	22.76	Cowell .....	0.35	19.73	11.52
Noarlunga .....	0.47	24.09	20.27	Point Lowly .....	0.05	18.82	12.08
Willunga .....	0.62	27.14	25.87				
Aldinga .....	0.41	23.46	20.24	YORKE PENINSULA.			
Myponga .....	1.03	34.23	28.44	Walleraro .....	0.24	19.22	14.09
Normanville .....	0.84	25.83	20.51	Kadina .....	0.29	21.28	15.93
Yankalilla .....	0.70	26.22	22.99	Moonta .....	0.41	21.53	15.25
Mount Pleasant .....	0.79	32.54	27.04	Green's Plains .....	1.13	21.78	15.72
Birdwood .....	0.83	31.64	29.26	Maitland .....	0.81	24.40	20.05
Gumeracha .....	1.03	35.46	33.25	Ardrossan .....	0.08	20.69	13.95
Millbrook Reservoir .....	1.10	34.73	—	Port Victoria .....	0.19	20.57	15.35
Tweedvale .....	1.22	36.15	35.54	Curramulka .....	0.26	20.09	18.16
Woodside .....	1.07	33.41	32.08	Minlaton .....	0.31	22.89	17.79
Ambleside .....	1.46	36.52	34.62	Brentwood .....	0.20	21.68	15.54
Nairne .....	0.86	28.09	28.43	Stansbury .....	0.02	20.09	16.96
Mount Barker .....	1.02	34.52	31.13	Warooka .....	0.15	23.55	17.69
Echunga .....	1.21	35.02	32.91	Yorke town .....	0.06	19.27	17.22
Macclesfield .....	1.39	31.98	30.53	Edithburgh .....	0.14	18.59	16.53
Meadows .....	1.40	36.30	36.04				
Strathalbyn .....	0.75	22.76	19.26	SOUTH AND SOUTH-EAST.			
MURRAY FLATS AND VALLEY.				Cape Borda .....	0.42	29.45	25.02
Meningie .....	0.26	18.83	18.66	Kingscote .....	0.35	22.68	19.01
Milang .....	0.15	14.87	15.42	Penneshaw .....	0.33	22.70	18.97
Langhorne's Bridge .....	0.43	16.71	14.55	Victor Harbor .....	0.32	22.31	21.43
Wellington .....	0.47	18.14	14.68	Port Elliot .....	0.37	23.03	20.00
Tallem Bend .....	1.14	20.31	14.11	Goolwa .....	0.13	20.22	17.83
Murray Bridge .....	0.25	17.15	13.83	Karoonda .....	0.43	19.55	—
Callington .....	0.32	17.26	15.37	Meribah .....	0.40	13.34	—
Mannum .....	0.08	16.82	11.52	Mindarie .....	0.32	12.51	—
Palmer .....	0.03	19.89	15.24	Pinnaroo .....	0.34	20.40	15.32
Sedan .....	0.25	18.39	12.13	Parilla .....	0.56	16.91	14.39
Swan Reach .....	0.04	17.02	10.82	Lameroo .....	0.51	18.49	16.27
Blanchetown .....	0.04	9.93	10.16	Parrakie .....	0.80	18.07	14.27
Eudunda .....	0.42	18.94	17.50	Geranium .....	0.76	19.17	15.96
Sutherland .....	0.17	16.63	10.12	Peake .....	0.67	24.54	15.91
Morgan .....	0.14	15.21	9.18	Cooke's Plains .....	0.44	20.99	14.84
Waikerie .....	0.28	14.40	9.68	Coomandook .....	0.60	20.64	17.31
Overland Corner .....	Nil	10.03	11.08	Coonalpyn .....	0.47	16.90	17.44
Loxton .....	0.47	13.31	12.58	Tintinara .....	0.65	19.87	18.54
Renmark .....	0.49	13.26	11.02	Keith .....	0.68	18.00	18.19
WEST OF SPENCER'S GULF.				Bordertown .....	0.88	19.52	19.44
Eucla .....	2.10	9.61	10.02	Wolseley .....	0.75	19.98	18.06
White Well .....	0.07	8.75	9.10	Frances .....	0.70	19.36	19.78
Fowler's Bay .....	0.30	11.01	12.19	Naracoorte .....	1.82	25.61	22.46
Penong .....	0.38	17.97	12.25	Penola .....	0.66	22.45	26.36
Murat Bay .....	0.06	10.97	10.32	Lucindale .....	1.36	24.80	22.91
Smoky Bay .....	0.05	12.02	10.92	Kingston .....	0.86	25.65	24.44
Petina .....	0.25	12.92	13.05	Robe .....	0.95	24.98	24.58
Streaky Bay .....	0.26	14.67	15.11	Beachport .....	2.17	24.38	27.27
Talia .....	0.19	16.58	15.38	Millicent .....	1.26	28.86	29.37
Port Elliston .....	0.32	17.33	19.53	Kalangadoo .....	1.09	30.61	—
Cummins .....	0.26	17.61	11.52	Mount Gambier .....	0.87	23.77	31.46

# AGRICULTURAL BUREAU REPORTS.

## INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings		Branch.	Report on Page	Dates of Meetings	
		Jan.	Feb.			Jan.	Feb.
Alawoona .....	*	—	—	Eurelia .....	566	†	—
Aldinga .....	*	—	—	Frances .....	*	28	25
Amyton .....	*	—	—	Freeling .....	*	—	—
Angaston .....	*	—	—	Gawler River .....	*	9	13
Appila-Yarrowie .....	*	—	—	Georgetown .....	*	14	11
Arthurton .....	*	—	—	Geranium .....	*	28	25
Ashbourne .....	§	—	—	Gladstone .....	*	14	11
Balaklava .....	*	14	11	Glencoe .....	*	—	—
Balhannah .....	†	13	10	Glossop .....	*	11	8
Barmers .....	†	10	7	Goode .....	*	11	15
Beetaloo Valley .....	*	†	10	Green Patch .....	574	†	6
Belalie North .....	*	14	11	Gumeracha .....	*	16	13
Berri .....	†	11	16	Halidon .....	*	—	—
Big Swamp .....	*	—	—	Hartley .....	*	—	—
Blackheath .....	†	14	11	Hawker .....	*	17	14
Black Springs .....	*	—	—	Hilltown .....	*	—	—
Blackwood .....	578	16	20	Hookina .....	566	12	9
Blyth .....	†	14	11	Inman Valley .....	*	—	—
Booleroo Centre .....	§	13	10	Ironbank .....	*	14	11
Borrika .....	*	—	—	Julia .....	*	—	—
Bowhill .....	*	—	—	Kadina .....	*	—	—
Brentwood .....	*	12	—	Kalangadoo .....	*	14	11
Brinkley .....	574	14	11	Kanmantoo .....	*	14	11
Bundaleer Springs .....	*	—	—	Keith .....	*	—	—
Burra .....	*	—	—	Ki Ki .....	*	—	—
Bute .....	*	10	7	Kilkerran .....	*	12	9
Butler .....	*	—	—	Kimba .....	*	—	—
Cadell .....	*	—	—	Kingscote .....	*	—	—
Caltowie .....	*	—	—	Kingston-on-Murray .....	577	—	—
Canowie Belt .....	*	—	—	Kongorong .....	581	12	9
Carrow .....	*	12	9	Koonibba .....	*	12	9
Cherry Gardens .....	†	10	7	Koppio .....	*	9	6
Glanfield .....	*	—	—	Kybybolite .....	*	12	9
Clare .....	570	13	—	Lake Wangary .....	*	14	11
Clarendon .....	*	9	6	Lameroo .....	*	—	—
Claypan Bore .....	*	11	8	Laura .....	*	†	10
Cleve .....	*	11	8	Leighton .....	*	—	—
Collie .....	*	—	—	Lenswood and Forest Range .....	†	28	25
Colton .....	*	—	—	Lone Gum .....	†	11	8
Coomandook .....	*	27	24	Lone Pine .....	†	—	—
Coonalbyn .....	†	13	10	Longwood .....	*	—	—
Coonawarra .....	*	—	—	Loxton .....	*	—	—
Coorabie .....	*	—	—	Lucindale .....	†	—	—
Craddock .....	*	—	—	Lyndoch .....	†	—	—
Crystal Brook .....	*	14	11	MacGillivray .....	*	11	8
Cummins .....	*	14	11	McLachlan .....	*	—	—
Cygnat River .....	*	12	9	Maitland .....	*	7	4
Dawson .....	*	—	—	Mallala .....	570	9	6
Denial Bay .....	*	—	—	Maltee .....	*	—	—
Dowlingville .....	570	†	—	Mangalo .....	*	—	—
Edillilie .....	572	28	25	Meadows .....	581	11	8
Elbow Hill .....	*	14	18				

## INDEX TO AGRICULTURAL BUREAU REPORTS—continued.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Jan.	Feb.			Jan.	Feb.
Meningie .....	*	—	—	Rendelsbam .....	*	11	8
Meribah .....	*	†	—	Renmark .....	*	—	—
Milang .....	*	14	11	Riverton .....	*	—	—
Millicent .....	*	7	4	Riverton (Women's) ..	*	—	—
Miltalie .....	*	†	11	Roberts and Verran ..	†	†	6
Mindarie .....	*	9	6	Rockwood .....	†	16	13
Minlaton .....	*	13	10	Rosedale .....	*	—	—
Minnipa .....	*	11	8	Rosy Pine .....	*	—	—
Mintaro .....	*	14	11	Saddleworth .....	*	—	—
Monarto South .....	574	—	—	Saddleworth (Women's) ..	*	—	—
Moonta .....	570	†	—	Salisbury .....	570	10	7
Moorak .....	582	12	9	Salt Creek .....	*	—	—
Moorlands .....	574	—	—	Sandalwood .....	*	—	—
Moorook .....	*	—	—	Shoal Bay .....	*	—	—
Morchard .....	*	14	11	Smoky Bay .....	†	—	—
Morgan .....	*	—	—	Spalding .....	*	—	—
Morphett Vale .....	*	12	9	Stockport .....	*	—	—
Mount Barker .....	*	11	8	Strathalbyn .....	*	17	14
Mount Bryan .....	†	—	—	Talia .....	*	9	13
Mount Byran East ..	*	†	—	Tantanoola .....	*	14	11
Mount Compass .....	*	—	—	Taplan .....	*	14	18
Mount Gambier .....	†	14	11	Tarcowie .....	*	10	7
Mount Hope .....	*	14	11	Tatiara .....	*	21	18
Mount Pleasant .....	†	—	—	Two Wells .....	*	—	—
Mount Remarkable ..	*	—	—	Uraidla & Summertown ..	*	9	6
Mundalla .....	*	11	8	Veitch .....	*	—	—
Murray Bridge .....	*	—	—	Virginia .....	*	—	—
Mypolonga .....	*	†	—	Waikerie .....	577	—	—
Myponga .....	*	—	—	Wall .....	*	—	—
Nantawarra .....	*	12	9	Wanbi .....	*	—	—
Naracoorte .....	583	—	—	Wareowie .....	566	†	—
Narridy .....	*	14	11	Watervale .....	570	—	—
Narrung .....	*	14	11	White-Yarcowie .....	†	—	—
Neeta .....	*	—	—	Wilkawatt .....	†	†	—
Netherton .....	*	†	—	Williamstown .....	569	4	1
North Booborowie ..	567	†	—	(Women's) .....	*	—	—
North Bundaleer .....	*	—	—	Williamstown .....	570	13	10
Northfield .....	*	11	8	Willowie .....	*	†	—
Nunkeri and Yurgo ..	*	—	6	Wilmington .....	*	11	8
O'Loughlin .....	572	11	8	Windsor .....	*	—	—
Orroroo .....	*	—	—	Winkie .....	*	—	—
Owen .....	569	—	—	Wirrabara .....	†	14	—
Parilla .....	*	—	—	Wirrega .....	*	—	—
Parilla Well .....	*	—	13	Wolowa .....	*	—	—
Parrakie .....	*	—	—	Wudinna .....	*	—	—
Parunt .....	*	—	—	Wynarka .....	*	—	—
Paskeville .....	*	—	—	Yabmana .....	*	—	—
Penola .....	†	7	4	Yacka .....	564	10	7
Petina .....	572	28	26	Yaduarie .....	*	†	8
Pine Forest .....	*	—	—	Yallunda .....	*	—	—
Pinnaroo .....	575	†	10	Yaninee .....	*	—	—
Pompoote .....	*	—	—	Yeslanna .....	*	†	—
Port Broughton .....	*	13	10	Yongala Vale .....	*	13	10
Port Elliot .....	†	21	11	Yorketown .....	*	—	—
Port Germein .....	†	14	18	Younghusband .....	*	12	9
Ramco .....	575-7	—	6				
Redhill .....	*	†	†				

\* No report received during the month of December. † Received. ‡ Held over until next month.  
† Formal meeting.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

HOOKINA (Average annual rainfall, 12in.).

November 10th, 1921.—Present: nine members and visitors.

THE YARDS AND OUTBUILDINGS OF THE FARM.—When the buildings of the farm were being erected, said Mr. J. Murphy, in a paper on the above subject, it was a good plan to see that the site selected was not on low or drifting ground. One of the first improvements should be the construction of a shed for the protection of the harness and implements. He preferred stone or concrete walls, roofed with galvanized iron. Stables were also a necessity, and if the structure was roofed with straw it would be a good protection from the hot sun during harvest time. A post-and-rail yard for the stables and a blacksmith's shop was considered necessary for the proper management of the farm. Where 200 sheep or over were kept, drafting yards constructed with wire netting and hurdles would prove of great assistance in handling the flock. If dairying was carried on it would be necessary to provide sheds and yards for the cows, and also a small room, close handy, for the separator. The laying on of a water supply to the yards and pigsties to effect a saving in time was also recommended. The speaker thought it advisable not to have the buildings erected too closely together, so that the danger of fire spreading from one building to another would be reduced to a minimum. In the discussion that followed, Mr. H. V. Heneschke thought it unwise to erect the building less than 100 yards away from the homestead. Mr. S. W. Scriven did not approve of wire netting for the sheepyards, because the stock would be constantly putting their horns and legs through the meshes. Other members were of the opinion that wire netting could be used in large yards, as it was easily raised should the sand drift to any great extent.

WARCOWIE (Average annual rainfall, 12.16in.).

November 19th, 1921.—Present: five members and visitors.

THE VALUE OF OUR EDIBLE BUSH.—Mr. A. G. Telfer (chairman), in the course of a paper on this subject, said there was no doubt that the edible bushes in Warcowie and the surrounding districts played an important part in the success of the stock-raising industry. The native acacia was one of the best-known native bushes, and was a valuable grazing plant. In dry seasons cattle and sheep could be kept in excellent condition, and it provided a very valuable fodder for cattle and sheep, and even in seasons of plenty, when the bushes were in bloom, the stock preferred it to other grasses. Other bushes mentioned by the speaker as being of great assistance to the stock raiser were the silver wattle, bullock bush, honeysuckle, and green or soap bush. He was strongly of the opinion that the value of the native edible bushes was so important that the propagation and protection of some of the varieties would be a very wise step. If that was to be carried out, one of the most important points to give attention to was the destruction of rabbits on every property. He thought the propagation of the bushes could be successfully carried out without interfering in any way with the

area devoted to wheat growing, and it would also greatly increase the stock-carrying capacity of the farms. It was decided to go into recess until the March, 1922, meeting.

EURELIA, November 19.—The report of the delegates to the Annual Congress (Messrs. Dinon and Kildea) was received and discussed. The subject "Take-all" was also brought forward, when members reported that crops in the district were very free from the disease. The Branch decided to go into recess until the completion of harvesting operations.

## MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

NORTH BOOBOROWIE (Average annual rainfall, 16.35in.).

November 15th, 1921.—Present: seven members.

MILKING MACHINES.—In a paper dealing with this subject, Mr. F. Giles said the scarcity and high price of agricultural labor had had a very important bearing on the introduction of the milking machine. With the machine a boy was able to milk quite comfortably from 26 cows to 30 cows per hour, whereas a dairyman who kept that number of cows would require at least five employees to do the work by hand. Again there was no doubt that the work could be performed



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more cheaply with the machine than with hand labor. Practically no labor had to be expended in operating the machine, and the farmer was not tired out after the morning milking before commencing the general work on the property. Many people were of the opinion that the machines injured the animals and ruined them for milk production. Such was not the case. He had never known a cow milked with the machines to lose a quarter, if she had been carefully stripped out after the tubes had been taken from the teats. It was also a fact that with the mechanical milker sores on the teats were reduced to a minimum. If a cow with cowpox was milked by hand there was a very grave danger of transmitting the disease to the rest of the animals in the herd, but with the machine there would not be nearly so much danger of the disease spreading. It was also noticeable that mammitis was not so frequently met with in cows milked by machines as those from which the milk was drawn by hand. Sanitation was a most important point in the success of the dairy, and it was in that connection that the machines had a very considerable advantage over hand labor. With the machines the milk was taken free from dirt and hairs directly from the udder to the separator. An interesting discussion followed, in which Messrs. Storr, Mayfield, and Dawson took part. It was decided to go into recess until the March meeting.

#### YACKA.

September 6th, 1921.—Present: 22 members.

**RABBIT DESTRUCTION.**—Mr. A. A. Duffield, who contributed a short paper on this subject, was of the opinion that the wet summer of last year was responsible for the large number of rabbits that were to be seen in practically every agricultural district. During the past few years the damage done by the pest on the rough farming land had been enormous, and he considered that if only a portion of the amount of the estimated damage was spent in providing wire netting a good profit would result, even after the time spent in attending to the traps had been taken into consideration. It was not that the pest destroyed the wheat, but it was also a well-known fact that on holdings where the vermin were in large numbers the stock would not graze on the pasture over which the rabbits had been feeding. Referring to methods adopted for the destruction of the rodents, the speaker said he had used the poison cart, but had not been very successful with it. Fumigating had also been given a trial, but the success of that method depended almost wholly on the condition of the soil at the time when the fumes were sent into the burrows. It was almost a waste of time to do the job when the land was dry, because the soil was so porous that it allowed the fumes to escape. A good job, however, could be carried out when the soil was wet. The spring traps required a good deal of attention, and were not, he contended, practical for the busy man on the land. The best plan, in his opinion, was to use wire-netting traps. It was only necessary to attend to the traps once a day, and if the rabbits were taken out and killed and placed into the burrows after they had been filled in, much would be done in ridding the property of the pest. No matter what plan was adopted, nothing would be successful unless each farmer did his share of keeping down the rabbits on his property. He also thought that the district councils should enforce the Vermin Act more stringently, and compel landholders to comply with the Act. In the course of the discussion that followed, Mr. W. H. Richards exhibited a home-made wire-netting trap with a patent door, which, he stated, was a good improvement on the old style of trap. Mr. Richards kindly offered to supply members with a pattern of the door. Mr. C. Rundle also spoke in favor of the netting trap. Mr. D. Nykiel said he had obtained good results by distributing baits made of a mixture of pollard, treacle, vinegar, and strychnine. Mr. S. Tillbrook recommended blowing up the burrows with gas generated from carbide that had been placed in the holes. Mr. H. Harrison said he had successfully blown up the warrens by pumping bi-sulphide of carbon into the holes with a fumigator, and then placing a lighted porcupine in the burrow. The Branch decided to urge on the district council the seriousness of the rabbit pest, and to request that the Vermin Act, as it applied to rabbit destruction, should be strictly enforced.



## LOWER-NORTH DISTRICT. (ADELAIDE TO FARRELL'S FLAT.)

OWEN.

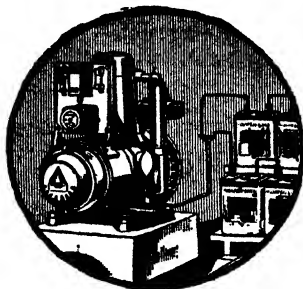
November 11th, 1921.—Present: 11 members.

An interesting and instructive paper, "Methods of Harvesting Cereals," was contributed by the Hon. Secretary (Mr. K. S. Harkness). The speaker traced the history of the progress of the various types of harvesting machinery from the time when the crops were harvested with the sickle and flail up to the present advanced forms of implements and machines. An interesting discussion followed, and Mr. Harkness replied to a number of questions.

### WILLIAMSTOWN (WOMEN'S).

November 5th, 1921.—Present: 17 members and four visitors.

**HOMESTEAD MEETING.**—The monthly meeting of the Branch was held at Mr. J. S. Hammatt's residence. Members inspected the garden, and spoke in terms of praise of the beautiful show of roses. The vegetable garden, orchard, and nursery were also visited. Afternoon tea was provided by Mrs. Hammatt, after which an inspection, under the guidance of Mr. Hammatt, was made of the tobacco plots and curing sheds.



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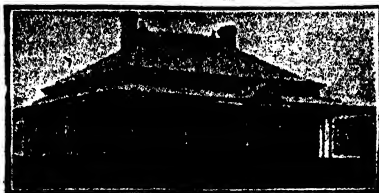
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CLARE, November 11th, 1921.—Mr. R. Baker (Lecturer on Dairying at the Roseworthy Agricultural College) attended the meeting and delivered an address, "The Management of the Dairy Herd."

MALLALA, November 28th, 1921.—A short paper on the subject, "Irrigation on the Farm," was contributed by Mr. Nairn. An interesting discussion followed, in which it was suggested that several landowners should co-operate with the idea of having a test bore sunk for the purpose of ascertaining if good supplies of water could be obtained for irrigation.

SALISBURY, November 1st, 1921.—Capt. S. A. White, C.M.B.O.U. (member of the Advisory Board of Agriculture), attended the meeting and delivered a lecture illustrated with lantern views, "The Economic Importance of Bird Life."

WATERVALE, November 14th, 1921.—Mr. A. S. Burgess contributed a paper, "Pear Drying," and an interesting discussion followed. Several other items of local interest were also brought before the meeting.

WILLIAMSTOWN.—The following programme of meetings for the session ending June 30th has been received from the Hon. Secretary, Mr. G. Brown:—January 13th—Address, Mr. J. B. Harris (Government Orchard Inspector). February 10th—"Viticulture," two members of Lyndoch Agricultural Bureau. March 10th—Lecture, "Dairying Industry," Mr. H. J. Apps (Assistant Dairy Expert). April 7th—"Fruit Drying," Mr. George Brown. May 5th—"Potato and Tomato Culture," Mr. E. D. Powell; "Vegetable Growing," Mr. J. Howarth. June 9th—"Pruning demonstration," 11 a.m.; address, 7.30 p.m., Mr. J. B. Harris (Government Orchard Inspector).

WILLIAMSTOWN, December 9th, 1921.—Papers on the subject, "The Importance of Afforestation," were contributed by Messrs. A. S. Wild and J. H. Mitchell, and a good discussion followed.

## YORKE PENINSULA DISTRICT. (TO BUTE.)

DOWLINGVILLE (Average annual rainfall, 13in. to 14in.).

November 10th.—Present: seven members.

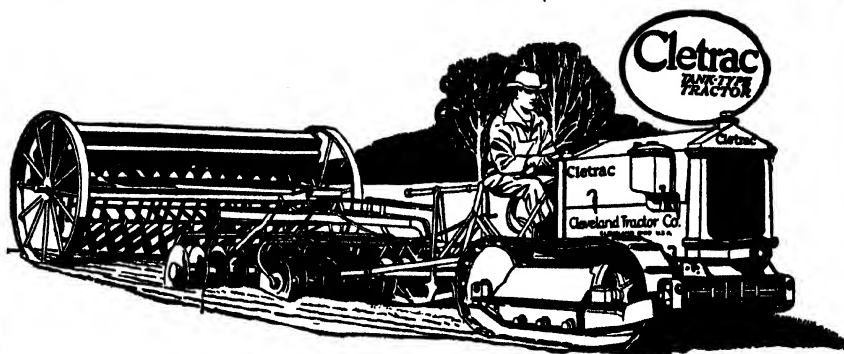
FARM IMPROVEMENTS.—Mr. W. J. Whittaker, who contributed a short paper dealing with this subject, said a good deal of time and labor would be saved if the floor of the barn was built about 3ft. above the level of the ground. If that was done the seed wheat and manure could be wheeled off the wagon with a sack truck into the barn. By making the doors of the barn about 8ft. wide the winnower could be taken into the shed for cleaning the seed wheat. In order to prevent the bottom sheaves of the haystack from becoming damaged, and also to stop mice from getting into the hay, the speaker suggested building a wall about 2ft. high, with galvanized iron projecting over the edges. The centre of the space enclosed by the wall could be filled in with stones. If there was a difficulty in obtaining stone for the wall, a wooden stand could be erected, and kerosine tins opened out could take the place of the galvanized iron. The Branch decided to go into recess for two months.

MOONTA (Average annual rainfall, 15.22in.).

November 19th, 1921.—Present: 15 members.

CLASS OF CATTLE MOST SUITABLE FOR THE DISTRICT.—Mr. G. E. Page, who contributed a paper on this subject, stated that for the economical production of high-grade butter there was no breed of cattle to beat the pure-bred Jersey cow. The Jersey was a docile and contented animal, and in places where the pasture was limited, and a considerable amount of hand feeding necessary, she would prove the most profitable dairy cow. He did not agree with the oft-repeated statement that the Jerseys were delicate cows, but he did think that they did not fill all the requirements necessary to meet what was termed "the farmer's cow." Many farmers desired to raise a few steers in conjunction with a high

standard of milk production from the heifers, and where such was the object in view it was only natural that a certain percentage of the heifers would fail to reach that standard. Again it was only a natural supposition that some of the cows would lose a quarter, or in some other way cease to be profitable, so that such animals would soon or later reach the slaughterhouse, and it was there that the Jersey failed. Of the dual purpose animals the Red Polls, Milking Shorthorns, and Friesians were the most typical. The speaker then gave an interesting description of the various breeds, and quoted figures showing the high returns of milk and butter fat yielded by individual cows in England and South Australia. Continuing, he said great care should be exercised when the animals to form the foundation of the herd were being selected. Attention should not only be paid to the pedigrees of the stock, but notice should be taken of the producing powers of both sire and dam. It was very pleasing to know that during the past season a number of well-bred bulls had been introduced into their district, and there was no doubt that they would make an improvement in the local dairy herds. In saying a word for the good cows of no particular breed, the speaker contended that it was a great pity that they should be mated to any bull irrespective of his breeding. The farmer with such a cow should mate her with the first bull of the breed he preferred, and pursue the same policy with her progeny. If that course was adopted the farmer would in a few years build up a herd of cows capable of transmitting their qualities to their offspring in a manner that no mongrel ever possessed. An interesting discussion followed, in which members agreed with the views expressed in the paper. It was contended that if farmers were to dispose of the half-bred Jersey that was so frequently noticed on the farms, adopt one of the large breeds, and mate the cows with an approved sire, a very marked difference in the production of the farm cows would soon be manifested. It was decided to go into recess until the March meeting.



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EDILLILIE (Average annual rainfall, 18.45in.).

November 5th, 1921.

**HOMESTEAD MEETING.**—The first homestead meeting of the branch was held at Mr. A. Palm's residence on above date. An inspection was made of the crops, poultry run, and fruit and vegetable garden, &c. A fine crop of Calcutta oats which yielded two tons of hay per acre was much admired. A paddock of 90 acres of Golden Drop wheat was considered the best crop members had seen for the season. Other crops were good, but had suffered from the ravages of take-all. Taken all round, the crops were a splendid example of what the district was capable of producing when thoroughly cleared and skilfully farmed.

**O'LOUGHLIN.**

October 12th, 1921.—Present: 11 members and five visitors.

**TIME AND LABOR SAVING HINTS FOR THE FARM.**—The monthly meeting of the Branch was held at Mr. C. Bergmann's homestead, when a paper on the above subject was contributed by Mr. J. R. Porter. The speaker first made reference to the gateways, which, he considered, should not be less than 12ft. wide. With a large opening the large implements of the present day could be taken from one paddock to another without any trouble, and there was not very much danger of stock crushing one another and breaking down the fences. If the gate was made of wire, a convenient method of fastening the wires was to use a stick with a loop on the top. After seeding operations had been completed, the drill should be overhauled, particular care being taken to remove all super and dirt from the stars and plates. The stable should be enclosed with a post and rail fence. It gave the farm a much better appearance than a wire enclosure, and the risk of the horses injuring themselves was reduced to a minimum. He called attention to the number of tanks in that district that were not covered. That meant that no small amount of water would be lost through evaporation. Prior to harnessing the team in the morning, the shoulders of the horses and the collars should be groomed and cleaned, and after work the harness should be hung up on pegs or rails, and given a dressing of neatsfoot oil once a year. Horses susceptible to sores should have their shoulders washed with a solution of bluestone and water after work, while an application of gall cure before harnessing up in the morning would afford considerable relief to the animal. The stable should be so constructed as to provide for plenty of ventilation and sunlight. A saddle hack should always be kept in the stable to bring the working horses in, and to do urgent messages to the township should occasion arise. In the discussion that followed members thought a greater width than 12ft. would be required for the gate to comfortably admit an eight-horse team. It was thought that the best preventive of sore shoulders was to keep the horses in good condition, and groom them thoroughly before commencing work. It was decided to inaugurate an annual competition for the best 50-acre plot of wheat in the district.

PETINA (Average annual rainfall, 13.19in.).

November 5th, 1921.—Present: 14 members and six visitors.

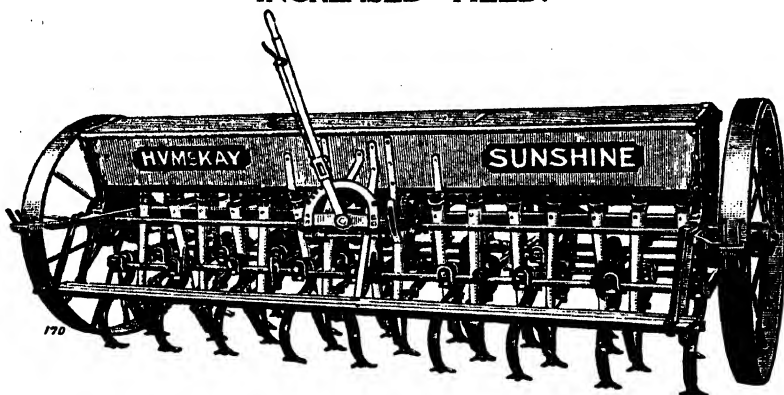
**SEEDING OPERATIONS.**—An interesting discussion took place on this subject. Members reported that in many instances crops that had been sown on grass land were showing signs of better returns than the seed drilled in on the fallow. Mr. E. Keeley was of the opinion that the whole of the trouble was due to the fact that the farmers worked their fallow whilst it was in a dry condition. Mr. A. Johnson could not agree with the view expressed by Mr. Keeley. Mr. Johnson said he had a large paddock of fallowed land, one half of which had been worked wet and the other dry, and he was of the opinion that the portion of the field that had received a dry working would yield at least 6bush. or 7bush. more to the acre than the area that had been cultivated in a moist condition. The remainder of the evening was devoted to a discussion of the report of the delegates who represented the Branch at the Annual Congress.

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GREEN PATCH, November 14th, 1921.—Messrs. Sage and Sinclair, delegates to the Minnipa Conference, spoke at length on the success of the gathering. It was decided that the Branch should go into recess until February, when the meetings would be held on the Monday before full moon.

## EASTERN DISTRICT.

### (EAST OF MOUNT LOFTY RANGES).

#### BRINKLEY,

October 15th, 1921.—Present: eight members.

Mr. E. G. Humphrey read an article from the *Journal of Agriculture*, "Depth of Ploughing and Manuring." In the discussion that followed, Mr. E. W. Pearson favored ploughing to a depth of 3in. in that district, and a dressing of lewt. of super to the acre. Mr. J. A. Schenscher agreed as regards the depth of fallowing if a mould-board plough was used, but if a disc implement was worked it would be quite safe to go a little deeper, because the disc did not seem to turn up the subsoil to the same extent as the mould-board plough. He also considered that nothing less than lewt. of manure to the acre should be applied. The report of the delegates to the Annual Congress (Messrs. Martin and Richards) was also received and discussed. At a further meeting held on November 12th, the Hon. Secretary (Mr. A. W. Richards) read an article, "Registration of Sires." Mr. J. Schenscher, in opening the discussion, thought if such a scheme was legalised the owners would charge such heavy fees for the services of their registered sires that it would prohibit many people from breeding foals. Mr. S. D. Marshall spoke in favor of the paper. Mr. H. Martin was of the opinion that legislation as mentioned in the paper was necessary, especially in respect to scrub bulls.

### MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

November 5th.—Present: 12 members and five visitors.

BLACKSMITHING ON THE FARM.—Mr. P. Luestner, who read a short paper on this subject, said one of the first points to attend to when preparing for work in the blacksmith's shop was to see that the fire was free from clinkers and coal dust. To do that the clinkers should be picked out and the dust put through a sieve. The pieces that did not go through the sieve should be placed on one side and put back into the fire, together with fresh pieces of coal. After the iron had been brought to a good welding heat, the piece of iron held in the right hand should first be placed on the anvil, and the iron in the left hand then laid on top of the other piece. If borax was used when welding steel or iron a good even heat would be obtained. It was always advisable to work the iron on the anvil so that the dirt would be removed, otherwise the pieces of iron would not adhere to each other. To temper a chisel it should be brought to a cherry red heat, next dipped in fat or oil, and finally immersed in water. The end of the chisel should be tried with a file, and when the file gripped on the steel the chisel could be cooled off. Steel shares sometimes had a tendency to crack when being tempered, but if they were first dipped in oil or fat, and then cooled off in the water, the trouble would be avoided.

#### MOOROOK.

October 3rd, 1921.

Members of the Moorook Branch visited the Kingston-on-Murray Branch on the above date and debated the question, "Fruit Trees *versus* Vines for the Murray." A draw was the decision given by the adjudicator.

DRYING GRAPE FRUIT.—At a further meeting held on October 14th, a paper on this subject was contributed by Mr. G. Scott. The speaker said the currants should be laid on the racks, about one bunch thick, but that could not be regarded as a standing rule, for the operation of drying should at all times be governed

by weather conditions. To cope with the wet weather, he expressed a preference for racks roofed with iron. After the bunches had been placed on the racks, the top and sides should be covered with hessian, and the fruit kept under shelter for five days. After the fifth day the hessian on the east side should be removed early in the morning, and replaced at mid-day. At noon the hessian on the west side could be taken off, and at night the whole of the fruit again placed under cover. On the seventh and succeeding days the hessians on both sides should be taken down each day and replaced again at night. With good weather conditions the berries should be ready for stripping on the ninth day. Many growers held different views as regards the correct time at which to commence rubbing off. He was of the opinion that when a cluster of currants hanging through the racks could be taken in the hands and squeezed without any juice coming away from the fruit, rubbing could safely be commenced. For that work he preferred a pitch fork. The next procedure was to take out the hessian from underneath the rack and divide the currants between that and another piece of hessian. The currants should next be spread out as evenly as possible, and allowed to stay on the ground to receive the full benefit of the sun. Once or twice during the day the berries should be heaped up and respread. After being exposed for a couple of hot days they should be ready for the sweat box. In referring to the heat of the dip, the speaker said he generally commenced his dip at a temperature of 210deg., and worked between that heat and 202deg. He was a firm believer in the practice of keeping a thermometer in the dip during the whole time that the work was in progress. It would be noticed that a film of scum formed over the surface of the dip during the process, and that should be removed with a piece of perforated tin each time it showed on the dip. A considerable amount of sediment or sand usually accumulated in the bottom of the dip, and it should be removed once or twice during the day with a broad-mouthed shovel. When harvesting was in operation the pickers should be instructed to cut the large bunches into smaller clusters, so that all the berries would come into contact with the caustic soda. For dipping the sultana the speaker suggested a solution of from 20galls. to 25galls. of water to 1lb. of caustic soda. When water was added it should be remembered that the strength of the dip had to be increased by the addition of caustic soda, in the same proportions as when the dip was first prepared. He considered it a mistake to spread the sultanas too thickly, as they required as much sun as possible. He stressed the importance of covering the racks at night, especially when dews were falling. The rubbing off and subsequent treatment of the sultanas was the same as in the case of the currants. For the lexias a dip in the proportions of 10 to 15 to 1 was required, a solution of 12 to 1 being an ideal one in the opinion of the speaker. When the grapes had been affected by weather conditions, the strength of the dip should not be reduced. If such a practice was pursued it would be found that any berries with split skins would dry out to practically a negligible quantity while the good grapes would be left in a "ballooney" condition.

#### PINNAROO (Average annual rainfall, 16.74in.).

November 3rd.—Present: 23 members and 37 visitors.

The Superintendent of Experimental Work (Mr. W. J. Spafford) attended the meeting and delivered an address on the subject, "Take-all." Mr. Murray-Jones (veterinary surgeon, of the Stock and Brands Department) was also present and spoke on "Toxic Paralysis in Horses."

#### RAMCO.

September 12th, 1921.—Present: 14 members.

**COMMON AILMENTS OF HORSES.**—The following paper was read by Mr. W. Hunter:—The most prevalent ailment of horses in sandy districts is sand. This complaint, in common with many others of a similar nature, can be easily remedied if taken at the right time. A drench of the following will, in nearly all cases, prove very effective:—One tablespoonful of turpentine and half a pint of raw linseed oil. It is often beneficial to also add two tablespoonfuls of spirits of sweet nitre as a preventive against stoppage of water. The chief indication of

the presence of sand is the animal lying down with its head inclined towards its left side. When taken by severe attacks the breathing becomes heavy and labored. Another serious trouble often taking place after a hard day's work in sultry weather is cold sweat. This complaint is observed in the way of wet patches on the coat, caused through poor circulation of the blood. When these signs appear the patches should immediately be rubbed dry with a bag or cloth. Stimulants should be given as a restorative, and a preventive in the way of a drench as follows:—Warm spirits, beer, or milk several times a week. Oatmeal should be put in fresh drinking water daily. Greasy heels can be cured by washing the legs with soap and hot water and dressing the heels daily with a mixture of 1pt. water, 1pt. methylated spirits, and 1oz. sulphate of zinc. Also place a dessertspoonful of sulphur in the food once daily for a fortnight. In the discussion that followed, Mr. W. Morgan said he used two dessertspoonfuls of carbonate of soda for sand. Mr. Modistach used two of carbonate of soda and one of ginger. Mr. J. Boehm advised the use of a pint of pollard in the feed three times a week as a preventive of sand. Mr. H. Hunter recommended honey and milk. Mr. Lewis said locally bred horses were seldom affected with sand, but newcomers were often affected. Mr. W. H. Morgan then initiated a discussion on "Cincturing the Currant Vine." He tabled a sample of orange and vine stems cinctured by a special tool he had constructed. The tool had been made from ½ in. spring steel, heated to a white heat, turned over at the end, and tempered in oil, and then placed in a hack saw handle. It was bent slightly larger on the one side to allow the piece of bark to slip out easily. Mr. Jones said the trouble with the saw was one did not know how deep a cut was being made.

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## RAMCO.

October 17th, 1921.—Present: 18 members.

\*CULTIVATION.—“An orchard may produce for a time without pruning, manuring, &c., but unless the soil is cultivated the results will prove unprofitable,” said Mr. W. Greene, in a paper on the above subject. By cultivation was meant the thorough working of the soil to a depth of 6in. to 8in. not less than three times during the year. Cultivation was absolutely necessary to conserve the moisture and to destroy weeds. Most of the light sandy soil in their district could do with less irrigation and more cultivation. Excessive irrigation impoverished the land and brought up the injurious salts from the subsoil to the surface. That caused the roots of the trees to accumulate near the surface, thereby reducing their food-supplying capacities. When roots of the trees were near the surface it became necessary to feed them with extra supplies of moisture and manure. Had deep rooting been encouraged from the first a considerable saving in labor and money would have been effected. Manure should be worked in as deeply as possible in order to give the roots a tendency to strike downwards, and when furrowing out there was very little danger of disturbing the fertiliser. Water should be applied where it would dissolve the manure and be of most benefit to the tree. Winter irrigation was very effective for deep-rooting trees, and ensured better crops, as the rainfall was not sufficient to thoroughly penetrate the subsoil. The best times for ploughing was during the months of May, August, October, or November. Very few orchardists in Ramco ploughed during May, but he had found that that practice enabled the soil to retain the winter rains better, for where other growers were turning over dry land in August, the soil in his orchard was quite wet. An interesting discussion followed, in which it was generally agreed that the majority of the orchard soils of the Murray Valley would not require so much water if tillage operations were carried out in a thorough manner. The certificates won by Messrs. J. and C. Boehm and E. Burroughs during the River Murray Pruning Competitions were presented by the chairman (Mr. H. Hunter). A report of the proceedings of the Annual Congress was tendered by Mr. F. G. Rogers.

## WAIKERIE (Average annual rainfall, 8.89in.).

September 19th, 1921.

CARE OF HORSES' SHOULDERS.—In the course of a paper dealing with this subject, Mr. A. H. Pope said “prevention is better than cure,” and the first point in reducing the danger of sore shoulders to a minimum was to see that the horse was working in a well-fitting collar. A piece of smooth wood, about 15in. in length, should be kept in the stable for the purpose of tapping all over the lining of the collar to make the stuffing free from lumps. The collar should next be brushed, and the shoulders of the horse thoroughly groomed. In the case of a colt being put to work for the first time, or a horse being harnessed up after a spell out in the paddock, the shoulders should be bathed with a strong solution of salt and water immediately after the collar had been taken off. If possible, such horses should only be worked for half a day at a time, until the skin had become somewhat hardened to the work. If circumstances did not permit of a horse with sore shoulders being thrown out of work until he was cured, the raising of the draught of the hames to a position above the sore would afford a considerable amount of relief to the animal. He deprecated the practice of cutting a hole in the collar. When that was done the collar very soon worked out of shape, and the stuffing chafed against the sore. The following mixture he had proved a valuable recipe for sore shoulders. Half a bottle of vaseline, half a cake of black lead ground to a fine powder, and two small teaspoonfuls of boracic acid. Apply by lightly rubbing over the sores every two or three hours. When the horse has finished the day's work the shoulders should be washed down with warm water and carbolic soap, and the sores smeared with vaseline.

KINGSTON-ON-MURRAY, October 28th, 1921.—Messrs. J. H. Pobke and J. Wetherall, delegates to the Annual Congress, gave a full report of the proceedings of the gathering. A discussion also took place on the subject, “Oats for Hay.”

A further meeting was held on November 18th, when a paper, “Seasonable Work on the Fruit Block,” was read by Mr. E. W. Chaston.

**SOUTH AND HILLS DISTRICT.****BLACKWOOD** (Average annual rainfall, 27in. to 29in.).

October 17th, 1921.—Present: seven members.

**HORTICULTURAL PRACTICES IN NEW ZEALAND.**—Mr. R. Fowler (Manager of the Blackwood Experimental Orchard) recently paid a visit to New Zealand, and the following paper, dealing with some of the methods adopted by the orchardists in that country, was read before the above Branch:—"I went to New Zealand with the idea that they were very much more advanced in fruitgrowing practices than we in South Australia, but I did not find it so. In some things, particularly in the matter of preventive legislation, I think they go further than we do, and the results are to be seen in well-sprayed and cultivated orchards and enhanced prices for fruit. They exercise greater control over the fruit placed on the market, and are more strict with the export fruit, not permitting fruit marked with black spot to be exported at all, though, personally, I think that is going too far. The climate of New Zealand seems particularly favorable to the growing of fruit, being fairly warm with a good rainfall, but with this drawback that it is also very humid, and therefore fungus diseases are particularly hard to combat. You will realise this when I tell you that in the best orchards they find it necessary to spray apples and pears eight and ten times for black spot, and apricots, peaches, and plums three or four times for shot hole and brown rot. I first of all visited a few orchards at Henderson. They go in fairly largely for Japanese plums, apples, pears, and peaches, and a good many strawberries are also grown. The soil is a good rich loam, with a clay subsoil, apparently fairly easy to work, and this condition seemed general in all the orchards I visited, with the exception of the Ruakura Government Experimental Farm, and there the soil seemed to be a drained peaty swamp land, with a whitish pumice sort of subsoil. In all cases the trees seemed to do well, and those I saw were well grown and vigorous, with the exception of some pear trees affected with fire blight. The work in the orchards generally is carried out on much the same lines as in South Australia. The ground is ploughed twice and well cultivated, a green manure crop being sown and ploughed in to supply humus to the soil. Artificial manure is also used to some extent. The trees are planted a little closer than we do, 16ft. x 16ft. being the distance most in favor for apples and pears. The trees are well pruned, or rather hard pruned, somewhat on the lines advocated in Mr. Quinn's book, but with a much more severe treatment of laterals. I found Mr. Quinn's book on 'Pruning' to be the standard work followed and recommended by their horticultural instructors. I had the pleasure of meeting a number of their various experts at the Farmers' School at Ruakura, and I also attended several demonstrations and lectures at the farm, which is the show farm in New Zealand, though the orchard attached to it is in rather a bad way in many respects. Fire blight is making a mess of the pear and apple trees, and the orchardist told me he found it almost impossible to grow stone fruits on account

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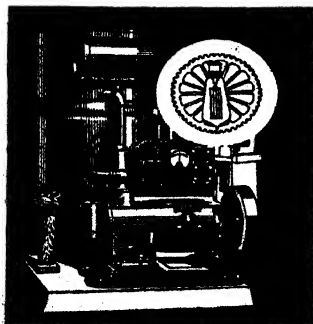
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A. B. DUDIN, Manager.

of brown rot. The main fruit-growing districts are in the South Island at Nelson, Christchurch, and Otago. I spent four days at Nelson with Mr. Hyde, the instructor in that district. He informed me that there are between 12,000 and 15,000 acres of apples and pears in that district, and the produce is all exported either to other towns in New Zealand or to England. Their overseas export has not yet reached great dimensions, but they are counting on it growing into a big thing later on. The prices realised this year were exceedingly good, as they were in the case of most of the Australian fruit; but, judging from the prices ruling for fruit in New Zealand, I should say, if they can be maintained, that in the average season they will find it will not to pay to ship, except as a means of keeping up the local price. Apples were selling in the shops up to 9d. a lb, and by the case from 14s. to £1, according to variety, Delicious being the top price and favorite apple, with Sturmers next. Other varieties grown include all our standard sorts, but Cleopatras are conspicuous by their absence. I believe a few are grown, the reason, of course, being the difficulty of keeping them clean. In pears, most of our standard varieties are grown, the principal one being Duchess, or Williams, as they are called over there. Other varieties, such as Louis Bonne, Director Hardy, and Winter Cole, which seems to be rather a favorite, are grown on a large scale. Spraying, as before mentioned, is a serious matter in New Zealand, but by persistent work, diseases are kept under control. For black spot of the apple, and pear, lime sulphur is mostly used. First, in the semi-dormant stage, or just as the sap movement commences; then in the pink calyx, and afterwards as circumstances demand. I believe six times is sufficient in an ordinary season. The first spray is at a strength of one in 10 to one in 25, then one to 50, and afterwards one in 100 to 120, with the addition of tobacco wash for aphids, or arsenate of lead for codlin. Bordeaux mixture is also used for the first two sprays, 8-6-40, then 6-4-50, and finally 3-4-40, with the first arsenate calyx spray, then following with lime-sulphur, as before stated. For codlin moth, arsenate of lead is used in the same way as in South Australia, though very little stress is laid on the calyx spray by some of the instructors, the general opinion being that very few moths are on the wing at that time, and consequently very few grubs are killed by the first spraying. In one orchard I visited the women folk were at work picking off the Sturmers the dried-up mummy fruits that are usually so numerous on this variety, the reason for this being the numbers of fruits that are subsequently damaged by pressure against these hard dried fruits. The Sturmers I found a much better fruit in flavor and color than ours, and I was told by one grower with a very fine orchard that he had never known his Sturmers to fail to set a crop. He had between 7,000 cases and 8,000 cases last season off a 15-acre orchard. A striking feature of the orchards I went into was the evenness of the trees and the similarity of the soil all over the orchard, and I was told the yield from the trees is also fairly even, averaging three bushels to four bushels per tree. At Nelson there is a number of co-operative packing houses, but I did not inquire closely into the methods of running these, nor did I have an opportunity to inspect one. They have a large fruitgrowers' federation, and I believe it is part of its duty to run the export business for the growers. At the time of my visit to Nelson, Mr. Attwood, the president of the federation, was there trying to overcome some difficulties that had arisen the previous season. I found that the Peacock case used in Australia is not allowed, the standard case being a slightly modified Canadian case, and I personally think it is a much handier and easier case to pack than our own bushel case. Growers that I spoke to about it had no love for our cases. Cool stores are used for storing, but at present are all in Wellington and Auckland, not in the fruitgrowing centres. Marketing conditions are also different from South Australia. I visited the markets in Auckland and Wellington, and found that everything is sold by auction under the hammer. In the Wellington market quite a number of salesmen were selling at the same time, but in Auckland things seemed to be better conducted, one auctioneer at a time holding the floor. The fruit and vegetable business seems to be in the hands of Chinamen or other colored men, and the shops are well kept generally and the fruit nicely displayed. Plums and peaches, I was told, do well, but apricots cannot be grown with success, and a few are produced around Central Otago, but they are very small and of no flavor. This fruit brings very high

prices, and is, I believe, sold in punnets as we do strawberries. Cherries and grapes are sold in the same way. Not many cherries are grown, and grapes are largely grown under glass, though I visited a 20-acre vineyard at the Government Farm at Te Kawahi, where they go in for winemaking to a slight extent. In vineyard management they are far behind Australia. I cannot describe their system of pruning, as they do not seem to follow any of our recognised methods. The favorite table grape is one called Albany Surprise, a local sport from Isabella, an American *Labrusca* variety. The vines are all on phylloxera resistant stocks, as they have this dreaded insect in their vineyards. I could not get any idea of the crops produced per acre, as apparently no records are kept either at the Government Farm or anywhere else; but I should think, judging by the growth, that it would be in the region of 3 tons to 4 tons per acre. Albany Surprise is a black grape, fairly loose in the bunch, with a fairly large round berry. These grapes are put up in punnets holding 3lbs., and realise as much as 1s. a lb. to the grower. A great deal of care is taken in the packing, cleaning, and grading of the bunches, and the growers make most of their own punnets, having a machine on the co-operative system, the punnets being made in the off season. I was told that white grapes, even Muscatels, are not favored on the New Zealand markets. As far as experimental work is concerned, very little seems to have been undertaken so far as fruitgrowing is concerned. I visited the experimental orchards at Ruakura Farm (near Hamilton), at Te Kawahi, and at Papanui, near Christchurch, in the South Island, but saw nothing interesting in any special way. Spraying problems seemed to be mostly those tackled, with a few variety tests at Te Kawahi and Ruakura. Diseases they have in abundance, but, notwithstanding all this, they produce a large amount of excellent fruit, though necessarily it is more expensive to grow, and fortunately it seems to command a better price than in Australia. Australian fruit is not very welcome, except in lines which cannot be produced in the Dominion, such as oranges, mandarins, and sometimes lemons, though this class of citrus seems to do fairly well. I saw some very nice lemon trees near Auckland. I visited with the Government inspectors the inspection sheds at Christchurch and Auckland, and saw Australian oranges being landed and inspected. The Washington Navels, from Griffiths, in New South Wales, and the Emperor Mandarins, from the same place, arrived in splendid condition, and were well packed and graded, being packed in a special case with a hinge lid, nailed and fixed down. Lemons arrived in rather bad order, numbers being mouldy. A consignment of ordinary sweet oranges from Salisbury, South Australia, was in good condition, but badly graded, too many small oranges having got into the cases. Navels were worth up to 24s. and 25s., and ordinary sweet 15s. to 21s. A fairly large quantity of Sevilles was also imported. Besides having all the diseases we have to contend with, they have also the dreaded fire blight, and brown rot and pear midge, two very destructive diseases, brown rot affecting the stone fruits, and the pear midge the young pear trees. While I am not able to say much in praise of the experimental work in



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fruitgrowing, I have nothing but admiration for the way in which scientific research is carried out, both by the Government departments in Wellington and by the Cawthron Institute in Nelson, and I think the Dominion is particularly fortunate in having a number of very enthusiastic and able young officers, who are devoting all their time to this branch of work. The following is a list of the various varieties of fruits grown commercially:—Apples—Dougherty, Sturmer, Delicious, Dunn's, Jonathan, Rokewood, Rome Beauty, Lord Wolseley, Scarlet Pearmain, London Pippin, Ballarat Seedling, Pioneer, Scarlet Nonpareil, King David, Democrat (Tasma), Hoover, Stayman's Winesap. Pears—Duchess (called Williams), Doyenne du Comice, L'Inconnue, Packham's Triumph, Beurre Diel, Beurre Rose, Beurre Capeaumont, Beurre Clairgeau, Directeur Hardy, Flemish Beauty, P. Barry, Kieffer's Hybrid, Eva Baltet, Josephine de Malines, Winter Cole, Winter Nalis. Japanese Plums—Nikho, Kitchener, Sharpe's Early, Wright's Early, Hale's Early, Burbank, Sultan, Doris, October Purple. European Plums—Monarch, Grand Duke, Coes, Golden Drop, Pond's Seedling."

#### MEADOWS (Average annual rainfall, 35.52in.).

October 19th, 1921.

Various matters of local interest, including the compulsory spraying of orchards, were brought before the meeting for discussion.

**CULTIVATION OF THE BROAD-LEAF WATTLE.**—At a further meeting held on November 16th, a paper on the above subject was read by Mr. W. Nicolle. The speaker said it was his intention to relate his experiences in wattle growing since the year 1910. In August of that year he planted 20 acres of second-class land that for about 25 years had been cultivated for hay crops. The land had set down fairly hard with the stock running on it, but there was no clearing to be carried out. The paddock was first scarified with a three-horse cultivator, and the seed prepared by soaking it in a bag in boiling water for about half an hour. After the water had been allowed to drain off, the seed was sown at the rate of 4lbs. to the acre with a bushel of oats the next day. The land was then scarified and cross-harrowed, and a two-wire fence erected to keep the stock out of the paddock. In 1911 another block containing 14 acres was cleared of timber and yaccas, and then sown to wattles and oats. Both paddocks made remarkably good growth, but he thought still better results would have been secured if the seed had not been sown quite so thickly. After the wattles had been properly established the wires were taken out of the fences and used on other parts of the farm. The first paddock of wattles was sold in the tree, and yielded an average of 2 tons 15cwt. to the acre. The second paddock was ready for stripping some years ago, but on account of the scarcity of labor the work had to be left until about three years ago, when the largest trees were barked. These represented about three acres, from which 6 tons of bark was received. Last year 23 tons were taken off, making a total of 29 tons of bark from the 14 acres. In addition to that he was of the opinion that there was still about 10 tons or 12 tons of bark to be stripped for the next two years or three years. The following estimates of expenditure and revenue were then quoted by the speaker:—Stripping, carting, and twine, £5 per ton; clearing and fencing, about 10s. per acre, £7; seed, 2s. per acre, 28s.; planting, 10s. per acre, £7. The price of bark was £11 per ton. Income, £319; expenditure, £160 8s., leaving a credit balance of £148 12s. In addition to the foregoing it should be remembered that grazing for the stock would have been provided by the oats. In discussing the paper, Mr. Durward said wattles grown under favorable conditions, and stripped before they became too old, would yield a second stripping of good bark.

### SOUTH-EAST DISTRICT.

#### KONGORONG.

November 9th.—Present: 17 members and three visitors.

**FARM BUILDINGS.**—In the course of a paper dealing with this subject, Mr. W. H. Bannister suggested that the farm buildings should be erected facing the east, in order to secure the maximum amount of sunlight. They were fortunate in that district in being able to obtain an abundance of stone that could be worked for

building purposes. He said that by making the roof of stone instead of iron a saving of 49s. per square yard would be effected. The rafters, would, of course, have to be placed closely together, and be made with substantial timber to carry the weight of the stone to prevent the roof from sagging. He favored concrete floors for the sheds, but thought it advisable to leave a rough surface on the concrete. Mr. A. S. Dixon, in discussing the paper, said it was a good plan to pull a garden rake over the cement on the floor before it was thoroughly dry; that would make a rough surface, and the floor would not be slippery.

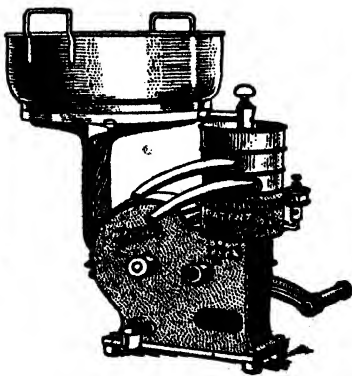
### MOORAK.

November 10th, 1921.—Present: 13 members and four visitors.

**THE IDEAL COW.**—Mr. G. A. Reinecke read a paper on this subject, in which he considered the Jersey to be the ideal breed of cow for the small landholder. Mr. W. A. Palamountain supported the views put forth in the paper. He considered the Jersey the best breed for the small landholder, and would pay more attention to them in future. Mr. J. Whitehead was not in favor of the Jersey. They were very small in the teats, slow to milk, and their bull calves as steers were worthless so far as butchers were concerned. The Hon. Secretary thought that Mr. Reinecke's idea of six to eight weeks' rest after lactation far too short; it did not give the beast sufficient time to gain condition when calving again. Mr. A. H. Kilsby quoted facts where he had obtained as good results from other breeds, and the offsprings were far more valuable from a butcher's point of view. Mr. O. Rehn supported the paper, and gave instances where good results had been obtained

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from the breed. Mr. K. McIntosh said with what experience he had had with Jerseys he intended to leave the breed alone. Mr. R. W. Land supported the paper. He had over 20 Jerseys at the present time, and was quite satisfied with the results obtained.

NARACOORTE (Average annual rainfall. 22.60in.).

October 15th, 1921.—Present: 12 members and two visitors.

**WOOL CLASSING.**—Mr. S. H. Schinckel gave a most interesting and instructive address and demonstration of wool classing in the Needwood woolshed as follows:—In preparing wool for market the first thing of importance is the cleaning of the sheds. See that there is a boot scraper at the door for the use of shearers and attendants, to prevent any dirt being brought into the shed. The grating should also receive attention to prevent any blockage. All dirty sheep should be attended to before entering the shed. Weather permitting, all sheep brought in for shearing should be allowed to remain in the yards for some time before entering the shed. This greatly minimises the dirty gratings, which is very noticeable when shearing ewes and lambs. When the shearing is in progress the belly wool should be picked up first, and if a wether, the stained pieces should be removed before putting the fleeces in a bin or bale. When the fleece is spread out on the table it should be skirted, all dirty, burry edges, points, and topknots should be removed, and if the clip is of fair size the pieces may be classed or picked. The longest, lightest, brightest, and most attractive should be kept by themselves and marked as "first pieces" and the balance "second." When the clip is only a small one I very much doubt if it is profitable to make two classes of pieces owing to the high cost of labor. One should always remember in classing wool that this is done to facilitate the buyers when inspecting it so that they may be able to tell the clean yield of it, which enables them to determine its full market value. If the wool is mixed or badly classed the buyer is at a great disadvantage and cannot tell the yields accurately. In classing the fleeces it is absolutely necessary, if the best results are to be obtained, to see that the longest, soundest, brightest, and lightest are baled by themselves and marked as the top line. In classing the fleeces do not let your eye deceive you. The eye can discern the strong and the fine, length and strength, brightness and soundness, but it may deceive you regarding the condition. This is always better done by the free use of the hand. The placing of the open hand on the rolled fleece, and closing it tightly, will always give a more reliable opinion of the lightness than the eye. Crossbred fleeces should be classed in the same way, but more care should be observed regarding the strength of the fibre. Any very fatty, discolored, or broken fleeces should all be kept separate, but if there are only a few of such they may be torn up and put with the second pieces. For dealing with lambs' wool, first place some light covering over the table. The wool should be carefully picked up with two boards and placed on the table. The longest, lightest, and brightest should be carefully taken out and marked "first," and the balance "second." Any very short or dirty wool is better put with the locks. When baling up good wool, never put a very heavy inferior fleece in the centre of the bale and think it will not be discovered. We must remember all fleeces are again handled at the factories by very experienced hands, and any shoddy work will be noted, and a black mark put opposite one's brand. Avoid making mixed bales if possible, but when it is unavoidable then try and make the wool in the mixed bale about equivalent in value, and mark it accordingly. If small sheep owners only kept one variety of sheep it would greatly mitigate the difficulties of dealing with mixed bales. If we wish to get the confidences of the buyers we must be honest in the way we get up our wool and thereby gain a reputation which will be to our monetary gain. The foregoing is a summary of the remarks of Mr. Schinckel as he went on spreading the fleece of each particular sheep on the table, and gave practical lessons on classing. The different kinds of sheep's wool classed added greatly to the value of the demonstration. Sometimes it was a fine Merino, sometimes a comeback, and sometimes a crossbred. Questions and comments were answered as he went along with the work, and a most profitable time was spent.



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# THE JOURNAL

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**All communications to be addressed :**

**"The Editor, Journal of Agriculture, Victoria Square, Adelaide."**

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T. PASCOE,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### Departmental Officers to visit Eyre Peninsula.

For the purpose of visiting a number of Branches of the Agricultural Bureau on Eyre Peninsula, more particularly those situated on the more westerly end, a party consisting of the Superintendent of Experimental Work (Mr. W. J. Spafford), a Government Veterinary Surgeon (Mr. F. Murray-Jones), and the Secretary Advisory Board of Agriculture (Mr. H. J. Finnis) will leave Adelaide on March 23rd. On the dates mentioned below these officers will address meetings at the centres stated. Mr. Spafford will deal with such matters of general agriculture as occasion demands and opportunity offers; Mr. Murray-Jones will deal with stock and veterinary subjects; and Mr. Finnis will give attention to the organisation of Branches of the Agricultural Bureau, and such matters connected therewith as may be found necessary. In addition, Mr. Murray-Jones will, where opportunity offers, deal with surgical cases in stock and inspect stallions submitted for the Government certificate of soundness. The itinerary will be as follows:—

Thursday, March 23rd.—Leave Adelaide.

Friday, 24th.—Meetings to be arranged.

Saturday, 25th.—Afternoon meeting, Roberts and Verran.

Sunday, 26th.—Travel to Elliston.

Monday, 27th.—Afternoon meeting, Talia; evening meeting, Colton.

Tuesday, 28th.—Travel to Mount Cooper, afternoon meeting; and to Streaky Bay, evening meeting.

Wednesday, 29th.—Travel to Smoky Bay, afternoon meeting.

Thursday, 30th.—Afternoon meeting at Goode, and evening meeting Denial Bay.

Friday, 31st.—Afternoon meeting, O'Loughlin; evening meeting, Koonibba.

Saturday, April 1st.—To Fowler's Bay, and evening meeting at Coorabie.

Sunday, 2nd.—Fowler's Bay.

Monday, 3rd.—Afternoon meeting, Penong.

Tuesday, 4th.—Maltee, afternoon meeting; and Petina, evening meeting.

Wednesday, 5th.—Evening meeting, Collie.

Thursday, 6th.—Pygery, evening meeting.

Friday, 7th.—Kimba, evening meeting.

### Irrigation Manual.

Papers prepared for meetings of Branches of the Agricultural Bureau in South Australia, specially interested in the problems of fruit-growing and its associated industries under irrigation conditions,

form the main contents of "Irrigationist Manual," No. 3, recently issued by the *Murray Pioneer*, of Renmark, South Australia. This volume deals specifically with the planting and care of trees and vines, general operations in the vineyard, the citrus orchard, fruit-drying, vine diseases, manures, and with the many other aspects of the horticulturist's activities. Like its predecessors, it contains papers written by many well-known and experienced fruitgrowers on the River Murray, various chapters being headed by such names as those of Messrs. H. D. Howie, Harold F. Levien, H. S. Taylor, F. R. Arndt, Wilson Francis, Oscar Weste, L. A. Chapple, E. J. Moritz, F. H. Basey, E. R. Moss, all of whom are more or less well known amongst River growers. The Manual is published in a handy size, at the price of 5s. per copy.

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## DEPARTMENTAL DOINGS.

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During January the Director of Agriculture (Professor A. J. Perkins) visited the Upper River Murray settlements, in connection with the inquiries of the committee to investigate the dairy position on the River Murray.

### FARM BUILDINGS.

The Field Engineer (Mr. J. Paull) visited Mr. A. F. Thompson, Kadina, in connection with the erection of a 100-ton reinforced concrete silo; Mr. G. L. Wishart, Angaston, in connection with hay and implement sheds and stables; Mr. H. E. Davies, Maitland, in relation to the failure of two 50,000gall. tanks; Mr. F. E. Gersch, Maitland, in connection with the erection of stables, hay shed, chaffhouse, &c. This officer also supplied plans of a barn, to hold 2,000 bags of wheat, to Mr. R. G. Townsend, Saddleworth.

### POULTRY, ETC.

A meeting of the Longwood Branch of the Agricultural Bureau, held at the homestead of Messrs. A. and H. Gurr, was attended by the Poultry Expert (Mr. D. F. Laurie) and Mr. C. F. Anderson.

### DAIRY, ETC.

The Dairy Expert (Mr. P. H. Suter) visited Orroroo, Murray Bridge, and Clare.

### GENERAL.

The Secretary Advisory Board (Mr. H. J. Finnis) visited and addressed meetings of the Renmark, Block E, and Loxton Branches of the Bureau.

Mr. C. P. Hodge (Instructor, Mallee Lands) also addressed the Loxton Branch.

Mr. F. C. Richards visited Weavers, and addressed the newly formed Branch there.

## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

Hon. Secretary, Agricultural Bureau, Longwood, reports sick pig which vomited a worm.

Reply—Isolate him and give him oil of turpentine. He will take this voluntarily in milk. The dose is one teaspoonful per 100lbs. body weight. Give it on three successive mornings on an empty stomach. Put him on light, easily digested food. Destroy any worms which he passes.

"P. E. N.," Cadell, has draught mare with a hard, painless swelling on the near side, which has been present some months. During the last few days two additional swellings have developed.

Reply—I would advise nothing further at present than the application of warm fomentals daily. The appearance of the two smaller painful swellings in the region points to an inflammatory change, and it would be as well to keep the probability of abscess formation in mind. The case may require surgical treatment, but I would be glad to hear from you as to the earlier history of the swelling, as well as its present condition, before advising surgical interference.

Hon. Secretary, Yadarrie Agricultural Bureau, reports heifer, from which milk is noticed to be running away before milking.

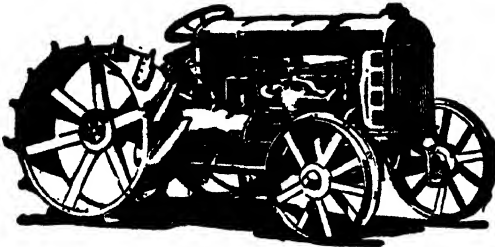
Reply—This is due to abnormal condition of the teats, which renders them unable to retain the milk when the milk cistern is full. It is an uncommon occurrence, except as a result of over-stocking, but one which is unlikely to respond to treatment.

"Farmer," Belalie North, has horse, 10 years old, hoof cut with wire. Penis is also hanging out.

Reply—The condition of the penis is consequent upon the bleeding from the injury to the foot. You should suspend the penis by a broad bandage or piece of sheeting, passing up over the loins. If you do not support the organ, the swelling will increase. Keep a pad soaked in the following lotion around the penis:—Sulphate of zinc, 4oz.; acetate of lead, 1oz.; cold water, 2 quarts; mix, and shake bottle before pouring out. Keep the part clean, and renew the dressing when soiled. Put him on laxative diet, and give him half a teaspoonful of powdered nux vomica, mixed with a little treacle, on the tongue twice daily. If the trouble does not respond to the treatment, nothing can be done except amputation of the penis. Treat the foot wound with antiseptic lotion. Dress daily. Keep the wound covered, to prevent it from being soiled.

Hon. Secretary, Agricultural Bureau, Winkie, reports horse with small lumps under the skin. Later on these developed into sores, and the animal is constantly rubbing himself.

Reply—Apply the following lotion to the parts affected with a swab two or three times a day:—Acetate of lead, 1oz.; tincture of opium, 1oz.; glycerine, 2ozs.; water, 3 pints.



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"J. N. R.," Oakbank, reports cow, difficulty in clearing after calving; also cow with lump under jaw.

Reply—Re treatment of cow with retained afterbirth. Normally these membranes are expelled within a few hours of calving. If this does not occur within 24 hours, it is advisable to remove them by hand. Cleanse the external genitals first. Wash the hands thoroughly, and lubricate them with carbolic vaseline or oil. Grasp the afterbirth close up to the genital opening with one hand, and follow them along into the genital passage with the other. Seize them as high up as possible, and exert a moderate amount of pull on them, especially while the cow is straining. Continue to renew the hold on them as they are being passed, until the whole mass is removed. If the attachment is firm, and they do not respond to moderate traction, it would be wise to leave the removal until the following day. Follow the removal of the membranes with a douche of permanganate of potash solution in tepid water. Continue the injection of this fluid until it comes away the same color as before injection. Use a flat teaspoonful of permanganate to a kerosine tin of water. If you are unable to remove the membranes, douche out daily with this solution until the membranes are removed or expelled. (2) The swelling under the jaw was probably a grass seed abscess, but it may be actinomycosis. If it becomes active again you should notify the Chief Inspector of Stock, Adelaide.

"B. A. Z.," Taplan, reports aged mare with the following symptoms:—Short winded, falling away in condition, and cough.

Reply—She has asthma. Give her only small feeds and feed frequently. Do not work her immediately after feeding, that is, do not work her on a full stomach. Water her before feeding. See that her feed is of good quality and free from dust. Give her a tablespoonful of Fowler's solution of arsenic twice daily in her feed for a fortnight. Follow this with a wineglass full of raw linseed oil regularly in the feed once a day.

Hon. Secretary, Meribah Agricultural Bureau, reports draught gelding with a discharge from one nostril, which has been present for about eight weeks.

Reply—The case is one of nasal gleet. It may be due to a diseased tooth or to disease of the bone. You should examine the mouth carefully, for which you will require a mouth gag. If you can detect a loose or diseased tooth, it must be removed. Disease of the bones in the nasal chamber requires surgical treatment, which can only be carried out by a veterinary surgeon.

"T. R. N.," Waikerie, has cow, first calf, with skin eruption all over the body.

Reply—Give her a drench containing:—Epsom salts 1lb., treacle 1lb., warm water 1 quart, and apply the following lotion:—Borax, 4oz. to a quart of water. Apply daily.

Hon. Secretary, Agricultural Bureau, Smoky Bay, reports disease in lambs, in which they become very poor.

Reply—It is possible that the disease is due to diet deficiency, but it is more probable that it is a parasitic anæmia due to worms. Some of these worms are very minute, and require close inspection to detect them. I would advise putting them in good pasture, the use of lick containing salt and sulphate of iron, and the administration of 1 per cent. solution of bluestone. This is easily made by dissolving 4oz. of bluestone in a pint of boiling water. Make this up to three gallons by adding cold water. Do not mix this in metal vessels. This quantity would be sufficient to dose 200 lambs. The dose is 1½oz., and may be repeated in 10 days or a fortnight.

Hon. Secretary, Agricultural Bureau, Watervale, reports flies attacking horse's sheath, and asks for preventive.

Reply—The flies are attracted by the natural secretion of the glands in the region. You should not have any trouble if the sheath and penis are thoroughly cleansed once a week. Use warm water and a little castile soap.

"J. A. G.," Bowhill, reports four-year-old gelding with a swelling on the point of the shoulder, which has been present for four weeks, and which has been fomented and blistered.

Reply—This swelling is a deep-seated abscess with a very thick wall. If the blistering has not caused it to point and burst I think you had better open it.

Clip the hair off part, wash the part with warm water and washing soda. Put a twitch on him. Use a sharp pocket knife, which you should boil for five minutes before using. Make an incision into the centre of the swelling, and large enough to drain it. You will probably find a small quantity only of thick yellow matter. Dress the wound daily with disinfectant lotion—1 part carbolic, phenyle, or izar to 40 of water (1 tablespoonful to a pint). Syringe the wound out with this solution also, and see that it does not become flyblown.

Hon. Secretary, Shoal Bay Agricultural Bureau, asks how to rear motherless foal.

Reply—Feed three parts cow's milk diluted with one part water. Warm it to blood heat, and add a little sugar. Use the milk of one cow, preferably one that has recently calved. Feed frequently. See that the feeding utensils are perfectly clean. Give one wineglassful of limewater in the food for a few days to check the diarrhoea.

“D. E. McL.,” Robe, has young pigs affected with rickets.

Reply—The disease is most common in growing pigs after they are weaned. Affected animals may develop paralysis of the hindquarters, and in the more chronic form there are alterations in the bones with stunted growth, &c. The disease can be prevented by supplying a suitable ration and by providing good hygienic conditions. Give good nourishing food, skim milk, pollard, grain, &c. Let them have a run out in pasture. Provide dry, clean, and well-ventilated sties. Give them one teaspoonful per head daily of sweet bonemeal in the feed.

### IMPORTS AND EXPORTS OF FRUITS, PLANTS, Etc.

During the month of December, 1921, 945bush. of apples, 173bush. of apricots, 16,850bush. of bananas, 3 packages of bulbs, 331bush. of oranges, 10bush. of passion fruit, 113bush. of peaches, 182bush. of pineapples, 6 packages of peanuts, 45 packages of plants, 6,725 bags of potatoes, 19 packages of seeds, and 2,752 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910. Of these, 41 packages of plants and 47 empty wine casks were fumigated, 196 second-hand potato bags and 45bush. of bananas (over-ripe) were destroyed, and 80bush. of oranges (absence of fruit fly certificate) were returned to State of origin.

Under the Federal Commerce Act, 3,114 packages of dried fruit, 950 packages of preserved fruit, 1 package of honey, and 1 package of jam were exported to oversea markets. These were consigned as follows:—To London—2,844 packages of dried fruit, 1 package of honey; to New Zealand—100 packages of dried fruit, 950 packages of preserved fruit; to Durban—170 packages of dried fruit; to Bombay—1 package of jam.

Under the Federal Quarantine Act, 6,417 packages of seeds, &c., were examined and admitted from oversea sources. Of these one package of grapes was destroyed on arrival, being prohibited entry into South Australia.

## SIXTH ANNUAL FARM COMPETITIONS, 1921, OF THE NARACOORTE AND KYBYBOLITE BRANCHES OF THE AGRICULTURAL BUREAU.

Under the following Committee of Management:—Messrs. S. H. Schinckel (Chairman), F. A. Holmes, J. Donoghue (Hon. Secretary), J. M. Wray, A. B. Feuerherdt, E. S. Alcock (Naracoorte Branch); A. Bradley, S. Sheppard, H. B. Schinckel, L. J. Cook, and J. Botterill (Kybybolite Branch).

[By W. J. SPAFFORD, Superintendent of Experimental Work.]

The farm competitions conducted by the Naracoorte and Kybybolite Branches of the Agricultural Bureau were continued again this year, making the sixth consecutive time that local farms, crops, and livestock have been entered and judged in similar competitions. The only variation in the classes open for exhibition was made by dividing the district in two for crops of wheat and oats, thus increasing the number of classes, and improving the competitions, because the conditions east of the Naracoorte Range are certainly not similar to those that obtain west of this range.

### BEST WORKED AND MANAGED FARM.

Two classes for farms have been arranged, and silver cups have been presented: (1) for farms over 750 acres, and (2) for farms under 750 acres. The Committee of Management arranged the following conditions and scale of points, and both of the classes are to be judged by them:—

#### CONDITIONS.

1. All competitors for the P. and A. Society's cups must be members of the Naracoorte Pastoral and Agricultural Society.
2. The competition shall be open to all persons farming or residing within the radius of the boundaries of the district council of Naracoorte.
3. Entries in writing, and accompanied by necessary fee, must be lodged with the Hon. Secretary of Farm Competitions, Naracoorte, not later than Friday, October 7th, 1921, except sheep, which close on Wednesday, September 21st, 1921.
4. All entries to be made in the name or names of the *bona fide* owners of the property entered for competition.
5. The judging will take place about the middle of November, 1921, for all classes excepting sheep, which will be judged in the wool, as soon as possible after the entries close, and the decision of the judges shall be final.



6. Competitors will be required to accompany the judges, and, if necessary, also drive them round the property entered for competition, and also to answer any question bearing upon the same, which may be put to them by the judges.

7. Where share farmers compete, the person who does the work receives the prize.

8. The judging for the best worked and managed farms will be done by the point system, from a commercial point of view, and to the following standard:—

1. System of cropping, including cultivation, rotations, manures, growing crops, summer crops, and fallow . . . . .	100
2. Most profitable class of stock on the farm, advantage being given to breeders (horses, sheep, cattle, pigs, and poultry) . . . . .	100
3. Implements and machinery suitable for the farm . . . . .	40
4. The general care of implements, harness, and farm equipment . . . . .	25
5. System of boundary and divisional fencing, including gates, sheep, horse, and cattle yards . . . . .	40
6. System for conveying surplus surface water from the farm land . . . . .	15
7. The provisions for fodders . . . . .	40
8. Watering stock and water supply . . . . .	40
9. Time and labor saving appliances and methods . . . . .	10
10. Arrangements of dwellings and outbuildings . . . . .	25
11. Plan and upkeep of orchard, vegetable, and flower gardens, and other plantings for beautifying the homestead . . . . .	20
12. Afforestation or shelter breaks . . . . .	30
13. Experimental work of any kind conducted . . . . .	15
14. Discretionary points allowed by judge . . . . .	50
Total . . . . .	550

#### CLASS I.—BEST WORKED AND MANAGED FARM.

Area, 750 acres or over. Prize, silver cup, value 5 guineas (presented by L. DeGaris, Esq., through the Naracoorte P. and A. Society), to be competed for and won twice by the same competitor; each winner's name to be engraved on the cup.

Only two farms were entered for competition this year in Class I., and have been allotted the following points, under the scale arranged by the committee:—

	Possible Points.	S. Sheppard, Ky-bolite.	F. W. Rochow, Hynam.
1. System of cropping, including cultivation, rotations, manures, growing crops, summer crops, and fallow . . . . .	100	55	31
2. Most profitable class of stock on the farm, advantage being given to breeders (horses, sheep, cattle, pigs, and poultry) . . . . .	100	90	63
3. Implements and machinery suitable for the farm . . . . .	40	32	30
4. The general care of implements, harness, and farm equipment . . . . .	25	23	20
5. System of boundary and divisional fencing, including gates, sheep, horse, and cattle yards . . . . .	40	30	30
6. System of conveying surplus surface water from the farm land . . . . .	15	9	--
7. The provisions for fodder . . . . .	40	27	15
8. Watering stock and water supply . . . . .	40	30	25
9. Time and labor saving appliances and methods . . . . .	10	8	--

*Class I.—Best Worked and Managed Farm—continued.*

	Possible Points.	S. Shep- pard, Ky- bybolite.	F. W. Rochow. Hynam.
10. Arrangements of dwellings and outbuildings . . . . .	25	15	15
11. Plan and upkeep of orchard, vegetable and flower gardens, and other plantings for beautifying the homestead . . . . .	20	16	18
12. Afforestation or shelter breaks . . . . .	30	15	11
13. Experimental work of any kind conducted . . . . .	15	3	—
14. Discretionary points allowed by judges . . . . .	50	30	20
Totals . . . . .	550	383	278

## TERRITORY OF NEW GUINEA. VACANCY FOR DIRECTOR OF AGRICULTURE.

Applications are invited for appointment as Director of Agriculture in the Territory of New Guinea, administered by the Commonwealth of Australia under mandate from the League of Nations.

The duties of the Director of Agriculture will be to advise on the agricultural development of New Guinea (both as to European-managed plantations and native gardens), to supervise scientific inquiries respecting plant diseases, soils, &c., and to control and manage, under the Administrator, the Agricultural Department of the Territory.

Applicants must have had a thorough training in the sciences underlying agriculture (honors degree preferred) and some experience of tropical agriculture (coconuts preferred). Age under 40 desirable.

The appointment will be in the first instance for five years, with opportunity of renewal if services are satisfactory.

The salary will be not less than £1,000 per annum. Applicants should state the salary they require. There is no provision at present for pensions; but the successful candidate will enjoy any pension benefits applicable to the post which may hereafter be conferred.

First-class passage to Rabaul *via* Australia for appointee and family (not exceeding three adult fares) will be provided; and return passages if the appointee vacates his post at the end of five years.

Three months' leave will be granted in each two years of service.

Applications should be addressed to the SECRETARY, PRIME MINISTER'S DEPARTMENT, MELBOURNE, and should reach him not later than the 31st March, 1922.

1. *System of Cropping*.—In the subdivision of the 100 points allowed under this heading, more points have been allotted to rotation of crops than for anything else, as being of more importance in a district with natural conditions, such as exist in the locality of Naracoorte. The judging was done on the following division:—Cultivation, 15; rotation, 25; manuring, 15; growing crops, 15; summer crops, 15; other forage crops, 15; and the points allotted each competitor are as follows:—

Subdivision of No. 1.	S. Sheppard, Kybybolite.	F. W. Rochow, Hynam.	Possible Points
(a) Cultivation . . . . .	9	6	15
(b) Rotation . . . . .	12	8	25
(c) Manuring . . . . .	11	7	15
(d) Growing crops . . . . .	10	8	15
(e) Summer crops . . . . .	—	—	15
(f) Other forage crops . . . . .	13	2	15
Totals . . . . .	55	31	100

Very little alteration in the farm practices was noticeable on either farm, so there is but little difference in the points allotted this year and the totals given last season. Mr. Sheppard gained a couple of marks for better crops, and one point for including Wimmera rye grass with the fodder plants he is testing. Mr. Rochow lost a few marks by his poorer crops, lack of summer crops, a smaller area under fallow, but gained a couple of points for seeding an area with Subterranean clover.

2. *Livestock*.—Both competitors make sheep their main line of livestock, so more points are allowed for sheep than for the other kinds, and the 100 points allowed have been divided up as:—Horses, 15; sheep, 45; cattle, 25; pigs, 10; and poultry, 5.

Live Stock.	S. Sheppard, Kybybolite.	F. W. Rochow, Hynam.	Possible Points.
Horses . . . . .	13	14	15
Sheep . . . . .	45	18	45
Cattle . . . . .	21	19	24
Pigs . . . . .	6	8	10
Poultry . . . . .	5	4	5
Totals . . . . .	90	63	100

Mr. James A. Brown, of Naracoorte, judged the sheep in the wool, and he allotted 100 per cent. of the available marks to Mr. Sheppard, and 40 per cent. to Mr. Rochow, at the same time reporting:—"Mr. Sheppard has a fine flock of sheep, which reflects great credit upon his management. Mr. Rochow's flock is very mixed in quality, and I would like to suggest to this gentleman that he clear out his present flock and buy a good line of Merino ewes." For Mr. Sheppard to get 90 per cent. of the marks available for farm livestock shows that he has very suitable animals and keeps them well. Other than the flock of sheep, the farm livestock kept by Mr. Rochow are of very fair types.

3. *Suitability of Implements, &c.*—Mr. Sheppard has a complement of implements and machines quite suitable for mixed farming operations, and, although Mr. Rochow's is not quite so complete, it is sufficient, and the implements are adapted for his conditions.

4. *Care of Implements, Harness, &c.*—Both Mr. Sheppard and Mr. Rochow give their farm equipment reasonable care and protection, particularly so with the former, who keeps his poultry away from the machines, as well as providing cover and repairing them as breakages occur.

5. *Fencing, &c.*—Mr. Sheppard has good fences, and keeps them in really good order; they consist mainly of fences with one driven iron dropper between good, solid wooden posts, with five plain wires and one barb, the remainder having only five wires; but provision has been made for another wire; and the soil is kept well mounded up to the bottom of these fences. Mr. Rochow also has good fences, in good order, consisting of solid wooden posts, carrying five plain and one barb wire.

6. *System of Surface Drainage.*—Mr. Sheppard has done some more drainage work, and so scores a couple more points under this heading.

7. *Provision of Fodders.*—For mixed farms, carrying and breeding large numbers of livestock, not enough conservation of fodder is practised. Mr. Sheppard makes cereal hay, saves and stacks straw, and does not overstock, and so his fields are well covered with fairly good feed; but his reserve of stored fodder is low. Mr. Rochow does not overstock; but his dry feed is not good, as so much of it is "silver grass," and he does not attempt to store much fodder.

8. *Watering Stock and Water Supply.*—Mr. Sheppard has paid more attention to reticulation of water around his homestead and for livestock than the other competitor, but in both cases better results would be secured from stock with more watering places.

9. *Time and Labor Saving Appliances.*—Home-made helps, which this heading is intended to cover, are only present in any number on Mr. Sheppard's farm, amongst the most important of which are:—(1) Poison cart of original design, (2) chaff-bagging box, (3) lever attachment for ploughs, (4) tools. Mr. Rochow showed nothing which can be included here.

10. *Arrangement of Buildings.*—Both Mr. Sheppard and Mr. Rochow have fairly extensive farm buildings, arranged conveniently as regards dwellings and the working of their respective farms.

11. *Orchard and Garden.*—Both Mr. Sheppard and Mr. Rochow have good farm gardens, but more care and attention is given by the latter to the upkeep of his garden.

12. *Breakwinds and Afforestation.*—Mr. Sheppard has homestead, poultry yards, and farmstead fairly well protected, and plants some pine trees every year for shelter. Mr. Rochow has his homestead protected, and planted another 50 pines this season.

13. *Experimental Work.*—Practically no experimental work is conducted by either of the competitors, but Mr. Sheppard does try on a small scale fodder plants new to him.

14. *Discretionary Points for Judge.*—The Committee of Management have allowed the judge 50 points for anything not covered by the

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subdivisions shown above, and in this connection 30 points were allotted to Mr. Sheppard for:—(1) The good methods and marked success in cleaning up his land. (2) The good work done in establishing a good fodder (subterranean clover) in place of the poor fodders of the district. (3) The improvement in storing his dry fodder (hay) by chaffing it into a shed, instead of stacking it. Mr. Rochow received his points for the general tidiness of his whole holding, and for following essentially mixed farming practices by crop-growing, dairying (milking eight cows), and breeding sheep, cattle, pigs, and horses.

*General.*—As both of the competing farms were in last year's competition, and as there was very little difference in the work being done or the care shown in the management, only slight difference has been made in the total marks allotted to each of them. Mr. Sheppard's farm management is most creditable, and the manner in which he has straightened it up, and improved it generally in such a comparatively short space of time, is deserving of the highest praise.

#### CLASS II.—BEST WORKED AND MANAGED FARM.

Area, under 750 acres. Prizes, silver cup, value 5 guineas (presented by L. DeGaris, Esq., through the Naracoorte P. & A. Society), to be competed for and won twice by the same competitor; each winner's name to be engraved on the cup.

No entries this year.

#### CLASS III.—BEST GROWING CROP OF WHEAT.

East of Naracoorte Range. Area, one-fifth of total area of wheat sown on farm, or not less than 25 acres.

From a farmer's point of view, the main consideration in wheat-growing is to produce crops returning the greatest amount of grain per acre, and to get the full market price for the grain when harvested, and in judging wheat crops these requirements must have first place. On this plan the apparent yield will be the most important subdivision, and must carry the most of the points to be allotted, and, as diseases are the main cause of decreased prices, freedom from them will be next in order of importance, and added to these subdivisions must be others showing trueness to type and freedom from weeds. The six crops submitted for judging have been given the following points:—

Name and Address.	Variety.	Apparent Yield.	Freedom from Disease.	Trueness to Type.	Freedom from Weeds.	Total
		60	20	10	10	100
S. Sheppard, Kybybolite . . . .	White Tuscan .	45	16	9	4	74
Kidman & Garnett, Laurie Park.	Federation . .	43	15	8	4	70
A. J. Johnson, Wild Dog Valley.	Yandilla King	33	16	6	8	63
P. J. Edwards, Struan . . . . .	Federation . .	31	12	7	4	54
	Major . . . . }					
A. H. Bradley, Kybybolite . . . .	White Tuscan	30	10	8	4	52
P. A. Laurie, Kybybolite . . . .	Queen Fan . .	26	10	9	2	47

## THE CROPS EXHIBITED IN CLASS III.

1. *Mr. S. Sheppard* (White Tuscan).—This was a very nice crop of wheat, being tall, fairly thick, and not very irregular; its main weaknesses consisted of much Subterranean clover and some Brome grass.

2. *Messrs. Kidman and Garnett* (Federation).—The Federation was a "wheaty" crop, but contained much barley, some trembling grass, and patches of "take-all" were in evidence.

3. *Mr. A. J. Johnson* (Yandilla King).—A clean crop, with only few weeds of any kind, but, unfortunately, barley was one of these weeds. Some "take-all" was present, and, although parts of the crop were really good, on the whole it was patchy.

4. *Mr. P. J. Edwards* (Federation and Major).—Both varieties were irregular and patchy, with a fair amount of "take-all," and quite a lot of weeds.

5. *Mr. A. H. Bradley* (White Tuscan).—This must have been a rather attractive crop a short time before being judged, but "take-all" had destroyed much of it, and it was then irregular in appearance. Of the weeds present, barley was the worst of them.

6. *Mr. P. A. Laurie* (Queen Fan).—"Take-all" was very bad in this crop, and a large assortment of weeds, including barley, silver grass, saffron thistle, trembling grass, and sorrell was present.

## CLASS IV.—BEST GROWING CROP OF WHEAT.

West Naracoorte Range. Area, one-fifth of total area of wheat sown on farm, or not less than 25 acres.

Only two competitors entered wheat crops in Class IV., but as each of them exhibited two crops, the total entries were four, which were judged as follows:—

Name and Address.	Variety.	Apparent Yield.	Freedom from Disease.	Trueness to Type.	Freedom from Weeds.	Total.
		60	20	10	10	100
R. A. Miles, Burnside . . . . .	Currawa . . . . .	51	14	9	8	82
R. A. Miles, Burnside . . . . .	Federation . . . . .	57	10	7	6	80
Smith Brothers, Morambro . . . .	Currawa . . . . .	45	15	6	7	73
	Federation . . . . .					
Smith Brothers, Morambro . . . .	Federation . . . . .	43	10	7	7	67

## THE CROPS EXHIBITED IN CLASS IV.

*Mr. R. A. Miles* (Currawa).—A heavy wheat crop, fairly free from weeds and diseases, and true to type. Contained a little barley, and was affected slightly with "take-all."

*Mr. R. A. Miles* (Federation).—A good grain crop, but affected with "red rust" and some "take-all." Contained barley, thistles, &c., sufficiently badly to lose a lot of points.

*Messrs. Smith Brothers* (Currawa and Federation).—Patchy irregular crops more or less badly mixed with other varieties, and showing a fair amount of "take-all."

*Messrs. Smith Brothers* (Federation).—A little barley, and some “take-all” in this crop, as well as having been badly attacked by “red rust.”

#### CLASS V.—BEST GROWING CROP OF OATS.

East Naracoorte Range. Area, one-fifth of total area of oats sown on farm, or not less than 25 acres.

Oat crops, from a grower's point of view, must produce heavy yields of grain or hay, and stand up well enough to be harvested without a great deal of trouble, and from the buyer's viewpoint must be free from bad weeds and diseases, and so the judging of these crops has been done on these lines, giving most points to the more important subdivision of probable yield. The five exhibits submitted have been marked as follows:—

Name and Address.	Variety.	Apparent Yield.	Freedom from Disease.	Trueness to Type.	Freedom from Weeds.	Standing.	Total.
		60	10	10	10	10	100
P. A. Laurie, Kybybolite . . .	Algerian .	53	9	10	8	10	90
A. J. Johnson, Wild Dog Valley	Algerian .	53	8	10	6	7	84
A. H. Bradley, Kybybolite . .	Algerian .	33	7	10	7	10	67
J. M. Wray, Hynam . . . . .	Algerian .	33	7	10	6	10	66
P. J. Edwards, Struan . . . .	Algerian .	24	7	10	6	10	57

#### THE CROP EXHIBITED IN CLASS V.

*Mr. P. A. Laurie.*—This was an extremely fine crop of oats, being tall, thick, clean, and standing up well. Some “loose smut” and a few weeds were present.

*Mr. A. J. Johnson.*—A very heavy crop of oats, but contained a good deal of barley, and had lodged fairly badly in patches, thus reducing its value as an exhibition crop.

*Mr. A. H. Bradley.*—This crop was dirty with cluster clover and hop clover, and contained much “loose smut.”

*Mr. J. M. Wray.*—Like Mr. Bradley's crop, this one was fairly badly affected with “loose smut,” and was dirty with drake and hop clover.

*Mr. P. J. Edwards.*—A light patchy crop, with many weeds of various kinds, and was badly cut about by caterpillars.

#### CLASS VI.—BEST GROWING CROP OF OATS.

West Naracoorte Range. Area, one-fifth of total area of oats sown on farm, or not less than 25 acres.

Only two oat crops were entered in this class, with the following results:—

Name and Address.	Variety.	Apparent Yield.	Freedom from Disease.	Trueness to Type.	Freedom from Weeds.	Standing.	Total.
		60	10	10	10	10	100
B. A. Miles, Burnside . . . . .	Algerian .	51	7	10	8	6	82
Smith Brothers, Morambro . .	Algerian .	40	7	10	7	4	68



## THE CROPS EXHIBITED IN CLASS VI.

**Mr. R. A. Miles.**—A thick, dense crop, but a bit patchy, containing a little barley and some “loose smut,” and lodged in places.

**Messrs. Smith Brothers.**—A rather irregular, patchy crop, containing a noticeable amount of drake, and badly lodged in parts.

## CLASS VII.—BEST HERD OF COWS.

All on the farm to be shown, but not less than five. Preference to breeders. Prize, cup or trophy. To be won twice by the same competitor. Each winner's name to be engraved on the trophy.

As milk production is the object in keeping cows, most of the points have been allotted to this part of the herd, and as the judging was not done on records, the 70 points for this was divided into 50 for appearance for milk, and 20 for care of animals; the remaining 30 points were allotted for size of herd, suitability of type to district, and purity of breed. The result of the judging is as follows:—

Name and Address	Breed.	No. of Cows	Appearance for Milk	Care of Cows	Suitability of Type	Purity of Breed	Size of Herd.	Total
		50	20	10	10	10	100	
Mr. A. Chamberlain, Naracoorte	Jersey . .	10	46	17	10	10	8	91
Mr. J. M. Wray, Hynam . . .	Jersey . .	7	46	19	10	8	6	89
Mrs. E. Grieve, Naracoorte . .	Jersey . .	7	40	17	10	8	6	81

## THE HERDS JUDGED IN CLASS VII.

Only three herds were entered in the competition this year, which is much below what should be expected in such a district.

**Mr. A. Chamberlain.**—This is a very fine herd of pure-bred Jersey cattle, and the majority of the cows are still quite young. The appearance of every animal shows that they all get proper treatment, and so their quality is exhibited to best advantage.

**Mr. J. M. Wray.**—Although the cows in this herd are not registered animals, they are pure bred or very high grades, and have been extremely well cared for.

**Mrs. E. Grieve.**—The cows in this herd show quality, but most of them are now old, and consequently past their prime.

## CLASS VIII.—BEST FLOCK OF SHEEP ON A FARM.

To be judged on commercial value. All the sheep to be shown to the judge's satisfaction. Preference to breeders.

**Mr. James A. Brown**, of Naracoorte, who judged the sheep, only had two flocks to inspect, and he marked these as follows:—

Mr. S. Sheppard, Kybybolite . . . . . 100 per cent.  
Mr. E. C. H. Schinckel, Kybybolite . . . . . 80 per cent.

**The More they Cackle—the More you Profit.**

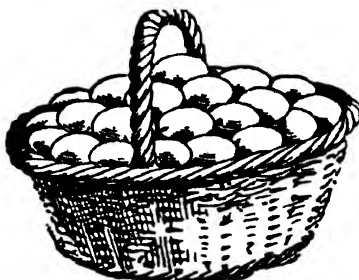
**GIVE YOUR FOWLS**

## **Karswood Poultry Spice**

(CONTAINING GROUND INSECTS).

**It keeps them Laying Freely without forcing.**

Now that the birds are getting well into their stride as the laying season advances, the poultrykeeper is liable to feel satisfied with his egg supply. But don't you let normal egg harvests keep you from going after a bigger yield—and added profit—with KARSWOOD. The cackle is the signal of success. KARSWOOD keeps the hens cackling. Read the following statement by an enthusiastic KARSWOOD user.



**Karswood proves a splendid grower for young chickens.**

Kumminin, *via* Bruce Rock, W.A.,

October 1st, 1921.

Dear Sirs,

I got a couple of 2s. packets of KARSWOOD POULTRY SPICE about a couple of months ago and I found it all you say. Our poultry had not been laying for months, and exactly three weeks after using the SPICE we got abundance of eggs; the poultry improved in a wonderful manner. We are now giving it to young chicks

and it is a splendid growing mixture, and puts life and energy into them. Please send by rail to Bruce Rock one 7lb. tin of KARSWOOD POULTRY SPICE (14s.).

Yours faithfully,  
(Sgd.) E. H. TOMKINSON.

**Note the economy.**

4d. packet supplies 12 hens one week.  
1s. packet supplies 20 hens 16 days.  
2s. packet supplies 20 hens 32 days.  
7lb. tin (14s.) supplies 140 hens 32 days.

**Australian Agents:**

New South Wales—COASTAL FARMERS' CO-OPERATIVE SOCIETY, LTD., Quay Street, Sydney.

Queensland—FARMERS CO-OPERATIVE DISTRIBUTING COY., Turbott Street, Brisbane.

Victoria and Tasmania—HENRY BERRY & COY., PTY., LTD., Collins Street, Melbourne.

South Australia—SOUTH AUSTRALIAN MILLING & TRADING COY., LTD., Baker Street, Port Adelaide.

Western Australia—WESTRALIAN FARMERS. LTD., Wellington Street, Perth.

*If supplied direct by Wholesale Agents, postage or freight is charged extra.*

## THE FLOCKS JUDGED IN CLASS VIII.

Mr. Brown separated the flocks during the judging, and reports on them as follows:—

*Mr. S. Sheppard.*—About 1,200 grown sheep; 300 lambs. All sheep bred by exhibitor.

360 Merino wethers (four and six tooth). In well-grown, forward condition, carrying good bulky fleeces, very even in quality, with long bright staple.

230 Merino ewes (four, six, and eight tooth), with lambs at foot, and carrying very bulky fleeces; bright, clean, and lengthy. Very even in both quality and size. A very fine lot.

230 two-tooth ewes and 50 four-tooth ewes. A very fine lot of even, well-grown sheep, showing good quality, bulky fleeces of bright, well-grown wool. Exceptionally well grown. A very fine lot.

250 Merino ewes (six and eight tooth), with lambs at foot, carrying good fleeces of wool, clean, bright, and of fairly good staple. In good condition for wet ewes. A good payable breeding ewe.

10 Merino rams of high quality, carrying great fleeces of high-class wool.

300 Merino lambs, exceptionally well grown and even, and showing good breeding. Carrying quite 4½lbs. of clean wool. Mr. Sheppard has a fine flock of sheep which reflects great credit upon his management.

*Mr. E. C. H. Schinckel.*—About 420 grown sheep, 100 autumn lambs, 180 spring lambs. All sheep bred by exhibitor.

72 Merino ewes (two-tooth), carrying good fleeces of bright, lengthy wool of fine quality. Very even and in splendid condition. A very fine lot.

86 Merino ewes (four, six, and eight tooth), with 45 spring lambs at foot. These ewes carry a good bulky fleece of bright, clean, and lengthy wool. Showing good quality and in splendid condition.

145 Merino ewes (four and five years old) with 135 spring lambs at foot. A good, useful lot of breeding ewes, carrying good fleeces for their age, of a fine quality.

107 Merino ewes (six and eight tooth), with 100 autumn lambs at foot. A very fine lot of ewes, carrying good fleeces of fine-quality wool. A very nice lot.

100 Merino lambs, exceptionally well grown, very even, and showing good quality.

180 Merino lambs (spring), showing good breeding.

6 Merino lambs, high class, and carrying very heavy fleeces of good quality.

Mr. Schinckel has a fine flock of sheep, which are a credit to him, and I feel sure that by careful attention and light stocking he will be hard to beat.

## GENERAL RECOMMENDATIONS.

This is the third consecutive competition which I have judged in this locality, and, in reporting on the previous ones, attention was drawn to various matters likely to improve the farming practices of the district.

In the *Journal of Agriculture* for January, 1920, the following points were mentioned:—

1. The scarcity of pigs.
2. The advantages of dairying.
3. The need of good rotation crops.
4. Heavier manuring of crops to improve the stock-carrying capacity of the pastures in years following.
5. Correcting excessive acidity by applications of lime.
6. Drainage of surplus surface water.
7. The overstocking of pastures.
8. The excessive feeding off of crops.
9. Extending the areas under peas.

In the *Journal of Agriculture* for January, 1921, it was pointed out that there were still ample evidences that the above points held good, and the following improvements were enlarged upon:—

10. Improving pastures with Subterranean clover.
11. Subdivision of holdings.
12. Summer crops.
13. Cultivation.
14. Varieties of crops.

During this year's tour of the district a few further possible improvements were brought to mind, and are worth thinking about.

15. *The Presence of "Take-all" in Wheat Crops.*—The amount of damage being done to the wheat crops of the district by this dread disease is very considerable this year, and hardly a crop was inspected which did not contain some evidences of it, whilst some were really badly attacked. Although it is rather unusual for the fungus to be so prevalent in the locality, unless care is shown in the growing of wheat crops, the damage done by the disease will increase. Where "take-all" has appeared (a) the stubble should be burnt; (b) some crop other than wheat should be grown on that block of land next time it is cropped; if cereals are to be grown, oats tend to starve out the fungus; (c) the land should be so cultivated that a good seed-bed is secured there; an ideal seed-bed is cultivated soil with only the immediate surface (say, 1½ in.) loose, and all the under layers well compacted together; (d) everything possible should be done to make the crop grow strongly in its early stages, and an increased dressing of superphosphate (to, say, 1½ cwt. per acre) is most likely to do this at present.

16. *The Effects of Superphosphate on Pastures.*—A very marked instance of the effects of increasing the dressings of superphosphate was noted on Mr. S. Sheppard's farm. This farmer has replaced the rough, poor feed, natural to most of his holding, with a good coating of Subterranean clover, and in two of his pasture fields, which were cropped with cereals last year, the headlands were double drilled, with

the superphosphate running on both trips. The effect of this extra superphosphate is really wonderful, the clover being at least three times as good as where less manure was used. In soils such as those existing on the east of the Naracoorte Range, which are very deficient in phosphoric acid, good pasture will only be obtained if much phosphatic fertiliser is used with the crops grown, or is applied direct to the pastures.

17. *The Presence of Barley in Crops.*—Barley was noticeable in many crops (wheat and oats) in the district, and some of them contained quite a high percentage. Barley, when present in sufficient quantity in a wheat crop, reduces the value of the grain harvested, and so care should be shown to prevent its appearance in such crops. Where land is fallowed properly, barley rarely remains in the soil for the 12 months without germinating, and so when this weed appears in a crop on fallowed land, the seed is usually sown with the wheat. Only seed from "clean" crops should be sown, and still better results will be secured if such seed is graded before putting it into the land.

18. *Wimmera Rye Grass.*—On the results being obtained in the district with Wimmera rye grass—on comparatively small areas, it is true—this forage plant is very promising, and should make, when grown in admixture with Subterranean clover, really good pastures. Sown with the cereal crop at the rate of 4lbs. or 5lbs. of seed per acre, and then allowing the field freedom from grazing for a year, should establish this grass; but it can be seeded by itself at the rate of 5lbs. to 10lbs. seed per acre, when it will give some feed the first year, and be firmly established.

## ADVICE TO ENSURE SUCCESS.



MANUFACTURERS -

THE ADELAIDE CHEMICAL AND FERTILIZER COMPANY, Ltd.,

CURRIE STREET, ADELAIDE.

## BOY IMMIGRATION FOR FARM WORK.

The Commissioner of Crown Lands and Immigration (Hon. G. R. Laffer, M.P.) in a recent statement regarding the immigration policy of the Government, referred particularly to a scheme of boy farm apprentices that had been approved by the Government, and which is considered to be specially suitable to the needs of an agricultural State such as South Australia. He was desirous that the subject of immigration should be lifted above the level of party politics, and viewed as a big Imperial question. In this connection it was necessary to put aside parochialism and to think, not only on a continental, but on an Imperial scale. Practically everyone, he assumed, was agreed that Australia needed more people of the right type.

Australia in area was virtually the same as the United States, but whereas the latter had a population of 110,000,000, this great island continent contained only 5,426,008 men, women, and children; and the great majority of these were located in the cities and towns, leaving the rural areas but sparsely populated.

### THE PERIL OF THE PACIFIC.

This lack of population was a serious matter—more especially as during recent years the centre of trade and commerce and human activities generally had shifted from the Atlantic to the Pacific. This fact undoubtedly intensified the need of increasing our population as speedily as possible with suitable and desirable settlers. No citizen of any modern State was totally independent of the acts and the influences of his fellows, and similarly no nation was so cut off from others that it could afford to ignore world developments that might affect its progress, and even threaten its very existence. Moreover, in regard to this problem, there was needed vision on the part of statesmen and people alike, and a realisation of what a vigorous, well-regulated policy of immigration meant to the present and future development of the undoubted resources of this country.

Mr. Laffer added that to ensure success the scheme would require careful organisation by the Government and enthusiastic support from the public. The administration would be through the State Immigration Department under the personal supervision of the State Immigration Officer (Mr. Victor H. Ryan).

### PRACTICAL IMPERIAL RECIPROCITY.

Six thousand heroic South Australians gave their lives for freedom in the Great War, and the State Government propose to make six thousand boy immigrants the objective of a scheme for obtaining lads from Great Britain for farm work. The scheme, in a word, is an instalment of practical Imperial reciprocity.

### FROM WHOM ARE APPLICATIONS INVITED?

From every farmer, gardener, pastoral, and other rural employer prepared to engage any of these boys and train them.

### WHAT BOYS WILL BE ELIGIBLE?

Respectable boys who are physically capable of, and willing to take up farm work, will be brought out under the scheme. Many of the boys selected will probably be sons, and possibly orphans, of British ex-service men. This will tend to strengthen the bond of empire.

HOW OLD WILL THE BOYS BE ON ARRIVAL IN SOUTH AUSTRALIA?  
Between the ages of 15 and 18 years.

### HOW LONG WILL BE THE PERIOD OF APPRENTICESHIP?

The Commissioner of Crown Lands and Immigration is empowered by the Immigration Acts of 1911 and 1913, and the regulations thereunder, to apprentice the lads on their arrival to farmers for not less than one year and not more than three years.

### WILL THE BOYS' INTERESTS BE SAFEGUARDED?

During the period of apprenticeship the Commissioner will act as guardian of the boys, whose interests, no less than those of the employers, will be thus amply safeguarded.

### WHAT WAGE WILL THE BOYS RECEIVE?

The minimum wage to be paid by the employer to the boy will be subject to the approval of the Commissioner.

### WILL THE BOYS BE ENCOURAGED TO SAVE?

Each boy will be paid 4s. a week as pocket money, and the remainder of his earnings will be paid by the employer to the Immigration Department, placed to the lad's credit in the State Treasury, and retained there at  $4\frac{1}{2}$  per cent. interest until he is 21 years of age, when the amount will be paid to him.

### WHAT ARE THE ADVANTAGES OF THE SCHEME?

1. Every boy secured will be comparatively young, with a long expectancy of life. The majority will go direct to the country, and thus tend to adjust the balance between city and country, which at present is excessively in favor of the former.

2. Boys thus received will be provided by their nominators with accommodation, and, therefore, will not accentuate any housing difficulty.

3. It is a practical attempt to repair the awful wastage caused among the ranks of South Australia's young manhood by the war, and for this reason should command the sympathetic support of all loyal citizens who desire that the sacrifices made shall help, and not hinder, in the cause of progress and civilisation in this sunny land. Undoubtedly the brave lads who made the supreme sacrifice would desire that arrangements should be made to finish the work of developing the resources of this great State, to which many of them had so zealously applied themselves.

4. The scheme will ensure that in a few years South Australia will have thousands of young men trained in agricultural and horticultural pursuits, and each of them possessed of a fair bank balance.

# EFFICIENCY ON THE FARM

For unfailing service, efficiency, smooth running and reliability, use

## Shell Lubricating Oils

These Oils flow freely under all conditions, and yet are adhesive enough to maintain their body when exposed to great heat.

## Shell Farm Oil

is a high quality, amber-colored, medium-bodied Oil graded scientifically for general bearing lubrication of lighter types of agricultural machinery

*Stocks held by all Leading Storekeepers*

**The British Imperial Oil Co. Ltd.**

ALL STATES AND  
NEW ZEALAND





**HOW CAN VARIOUS SOCIETIES HELP?**

In developing the scheme there will be ample opportunity for the Government to take full advantage of the activities of the various patriotic, religious, and philanthropic societies now existent in the State. In some instances it may be possible to assist the lads by making a further donation towards their passage money, because, even after taking advantage of the contract rates and the Government contribution, the steamship fares for the boys will be comparatively high, and any relief in this direction would be welcomed by the lads. The societies can also assist in extending the right hand of fellowship and goodwill to these youthful settlers, and maintaining that personal touch which is highly desirable and beneficial in dealing with all classes of new arrivals, and especially youths. Indeed, with enthusiastic support from representative bodies and employers generally, the success of the scheme is assured.

**HOW CAN A BOY BECOME A FARMER?**

The boy's account having been debited only with portion of his travelling expenses to the State, and the cost of clothing and other necessities purchased for him, he will, on attaining his majority, have gained valuable experience, and, in addition, have a substantial sum of money to his credit. Adding to this from the wages he subsequently earns, he would soon be in a position to become a farmer himself. Each boy, under the joint Commonwealth and State scheme, will pay £26 for his passage, but only £10 of this will be required before he leaves London, and the balance may remain on loan, free of interest. Prior to embarkation, he will also deposit with the migration authorities a sum of £2, which will be refunded to him on arrival in Adelaide.

**HOW CAN A BOY BE SECURED?**

Applications for boys must be made to the State Immigration Officer, Government Tourist Bureau, King William Street, Adelaide.

APPOINT THE—  
**EXECUTOR TRUSTEE AND AGENCY COMPANY**

OF SOUTH AUSTRALIA, LIMITED.

Executor and Trustee of Your Will.

Established, 1880. Estates and Trust Funds over £4,500,000. Write for our Booklet.

**DIRECTORS:**

L. A. JESSOP, (Chairman).

W. HERBERT PHILLIPPS.

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Pastoral and Agricultural Inspector ..  
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R. W. WILLIAMSON

22, GRENFELL STREET

- - ADELAIDE

## ORCHARD NOTES FOR THE SOUTHERN DISTRICTS.

### FOR JANUARY.

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[By CHAS. H. BEAUMONT.]

Harvesting of fruit will be the main work this month. It will be a light harvest, therefore more than ordinary care should be exercised so that no fruit will be damaged. We cannot afford to waste any.

Growers who intend to dry fruit should use only good grades and mature fruit; small fruit and culls may be used for jam. Those who have evaporating plants must have them in good running order, ready for use at any moment; the weather cannot be relied on.

Exporters must make themselves conversant with the new regulations governing the grading and branding for export. The inspectors of exports have no option in the matter; they must put aside all produce offered which does not comply with the instructions issued. See that your cases are properly certified.

Curculio beetle is usually troublesome this month; use the zinc traps, filled with oil, or spray with arsenate of lead, 2ozs. to 1gal. of water; for small plants, a band of sheepskin with the woolly side out will prevent the insect climbing up; or a band of very thin tinned plate will have a like effect.

The weather has not been favorable for the spread of fungus pests, but they must be watched. For apple and pear trees try the lime sulphur compound if necessary. It can be mixed with "black leaf 40," if woolly aphid is showing. Do not neglect woolly aphid; you must check it, or it will certainly destroy your fruitbearing wood. Watch the vines for downy mildew. Keep a coat of arsenate of lead on your apples and pears; this is the only way to make sure that codling moth will not spoil your fruit.

Budding should be in full swing this month. It is not a difficult operation, but requires care and attention and quick dispatch; use only fresh clean wood and good healthy buds of a known good tree.

There have been many complaints of the depredations of birds in the orchards. Is it not about time that an efficient automatic scarer was made? We are ready to acknowledge the usefulness of the birds at the proper time, but we want them to go elsewhere at fruit time.

---

### FOR FEBRUARY.

Fruit picking and marketing is the main work of the month. Greater care is necessary in the preparation of fruit for market if the best prices are to be obtained. Good peaches should be picked on to trays, and not in bushel cases. See that you get a good even quality

throughout; no topping is allowable. Fruit too ripe to pack may be dried. Bulletins describing the process may be obtained on application, also for preserving.

Do not allow diseased fruit to rot under the trees, as this is a sure way to increase the trouble in the future.

Mark the best trees and vines so that scions may be used for only the best bearers.

Keep on spraying the very late varieties of apples to control codlin moth. When spraying or sulphuring be necessary, see that it is done thoroughly; most of the labor and material used is wasted by careless management.

Irrigation of citrus trees and young trees and vines is mostly required this month. I am often asked what is a proper amount of water to give, and it is almost impossible to give the amount in gallons; what is wanted is to moisten the soil about the tree without having surplus water to run to waste. After watering see that the soil is loosened about the trees; cultivation is the main factor of irrigation.

If packing for export, get a copy of the new regulations, so that no trouble will ensue at the Port.

**SUPER** has helped to build up  
your District's prosperity, and:—

**WALLAROO-M<sup>c</sup>LYELL SUPER**  
PAYS YOU BEST

# OFFICIAL FORECAST FROM DECEMBER REPORTS OF THE WHEAT AND WHEATEN HAY HARVEST OF 1921-22.

[By W. L. JOHNSTON, Government Statist.]

Divisions.	Grain.			Hay.		Fed Off.
	Acres.	Bushels.	Average.	Acres.	Tons.	
Central .....	754,810	9,418,690	12.48	186,510	269,150	1,725
Lower North .....	715,350	10,117,089	14.14	97,935	134,424	3,535
Upper North .....	221,640	2,485,460	11.21	39,730	40,805	620
South-Eastern .....	228,130	2,460,440	10.79	13,110	12,830	850
Western .....	429,560	3,094,805	7.20	33,475	24,120	2,015
Grand total .....	2,349,490	27,576,484	11.74	370,760	481,329	8,745
Actual—1920-21 .....	2,167,646	34,258,914	15.80	320,543	477,845	8,259

NOTE—It is estimated that the grain and hay areas shown above include 24,975 acres which failed entirely, and, in addition, 8,745 acres were fed off.

## BARLEY AND OATS.

*Barley.*—3,032,192 (3,946,062) bushels—Average 18.20 (19.53). *Oats.*—2,026,757 (2,331,067) bushels—Average 13.56 (13.96).  
*Oaten Hay.*—226,330 (275,001) tons—Average 1.15 (1.19).

## ADVISORY BOARD OF AGRICULTURE.

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The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, December 14th, there being present Mr. C. J. Tuckwell (Chairman), Capt. S. A. White, Col. Rowell, Messrs. Williams, Dawkins, H. Wicks, and the Secretary (H. J. Finnis). Apologies were received from the Director of Agriculture (Professor Arthur J. Perkins), the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch), and Mr. W. S. Kelly.

*Afforestation.*—The Secretary reported that the Hon. the Minister of Agriculture had expressed his willingness that the Forestry Sub-committee of the Advisory Board should interview the Commissioner of Forest Lands and discuss with him the proposals of the sub-committee. The Secretary was directed to arrange the meeting.

*Weighing Mallee Stumps.*—A communication from the Coonalpyn Branch, wherein it was stated that errors had occurred in the weighing of stumps at Tailem Bend, was referred to the Railways Commissioner, who stated that full inquiries had been made into the matter and that the staff at Tailem Bend had been instructed to exercise greater care in future in arriving at and recording the weights of loads at that station. The Secretary was instructed to advise the Branch accordingly.

*Experimental Farm on the Murray.*—In reply to the Thirty-second Annual Congress resolution urging the establishment of an experimental farm on the reclaimed areas of the Murray, the Minister of Agriculture stated that the matter would have to stand over until there was a material improvement in the financial position.

*Veterinary Surgeons for Outlying Districts.*—The resolution carried at the 1921 Annual Congress, "That the Government be requested to appoint Veterinary Surgeons for the outlying districts, including Eyre Peninsula," was forwarded to the Minister of Agriculture, who stated that he was not prepared to recommend the Government to incur expenditure in that direction at present.

*Visit by Officers of the Department to Eyre Peninsula.*—The Minister of Agriculture intimated that he would place a motor car at the disposal of the Superintendent of Experimental Works, the Secretary of the Advisory Board, and a veterinary surgeon to enable them to visit Branches of the Agricultural Bureau on Eyre Peninsula.

*The Dairy Bill.*—A draft of the proposed Dairy Bill was received from the Minister of Agriculture. Consideration was deferred until next meeting.

*Removal of Crane and Stockyards from Geranium.*—A communication was received from the Geranium Branch protesting against the removal of the crane at that station. The Branch also stated that rumors were in circulation to the effect that the stockyards were also

to be removed. The matter was referred to the Railways Commissioner, who reported that business at Geranium did not warrant the crane being left at that station. If circumstances altered a derrick crane could be erected at Geranium. The Commissioner further stated that he was not aware of any proposal to remove the stock-yards. The Secretary was instructed to advise the Branch of the Commissioner's report.

*Take-all Investigations.*—At the recent Conference of Pinnaroo Line Branches of the Agricultural Bureau, the following resolution was carried:—"That this Conference brings under the notice of the Advisory Board of Agriculture that take-all causes great losses, and that steps be taken seriously to consider some means of overcoming the trouble." The resolution was transmitted to the Director of Agriculture (Professor Arthur J. Perkins) who reported as follows:—"For the information of the Advisory Board, I beg to state that the parasitic nature of take-all is generally admitted. It is also admitted that the cause of its intense development over recently cleared mallee lands is attributable mainly to the tendency to grow wheat several years in succession, and the open, loose, defective tillage which is unavoidable in partially cleared land. It is, moreover, the experience of other portions of the State previously covered with mallee that in the course of time, as tillage operations become more normal, the disease tends to disappear. This has certainly been the experience of the bulk of Yorke Peninsula, and it is assumed that it will be the experience of the Murray mallee lands. Indeed, it is already claimed by many good farmers that, so far as they are concerned, serious outbreaks of take-all are more less a thing of the past. The farmers throughout mallee areas recognise that the growing of alternate crops of oats has a restraining effect on the disease. Notwithstanding these facts, and in view of the insistence of the Mallee Branches, the Professor of Botany has been specially requested to make a further study of this disease, and with this object in view special circulars have been sent out to all Branches for the collection of samples of diseased plants and for other information likely to be of value."

*Resolutions from Minnipa Conference.*—(a) "That this Conference strongly urges that the rates charged for water on all tanks and wells on Eyre Peninsula be considerably reduced." On the motion of Col. Rowell, seconded by Mr. Dawkins, it was decided to forward the resolution to the Minister of Agriculture with a request that it might be brought under the notice of the Department controlling the water supplies. (b) "That all applications for the Short Course at the Roseworthy Agricultural College be sent to the Advisory Board for them to allot which delegates shall be selected, and that preference be given to those Branches that were not represented last year." It was proposed by Mr. Dawkins, seconded by Mr. Wicks, that the matter be considered when arrangements were being made for the 1922 Course. (c) "That the Government consider the necessity for the appointment of a Veterinary Surgeon on Eyre Peninsula." The resolution was received.

*Resolutions from Conference of Hills Branches.*—(a) "That once every year the names of officers and members of each Branch be published in the July issue of the *Journal of Agriculture*." At the instance of Mr. Dawkins, seconded by Mr. Wicks, the Board decided that the request could not be entertained. (b) "That the Advisory Board be asked to return to Branch Secretaries original papers, so that they may be kept by the Branch for reference." It was decided that on application to the Secretary of the Advisory Board papers submitted at Branch meetings would be returned to Hon. Secretaries.

*Slaughter of Diseased Cattle.*—The Wilmington Branch resolved "That on no account should the milk, cream, and butter be sold for use from a cow that had been treated for cancer or serious disease, such as pleuro, nor should the carcass of a cancerous animal be used for human consumption." The Chief Inspector of Stock (Mr. T. H. Williams) pointed out that if the Branch wanted to take steps in the directions suggested by the resolution they were given power to do so under the Health Act. The local butchering establishments could be visited at the times of slaughtering by a competent meat inspector and each carcass examined before being passed for consumption. It was decided that the Secretary should advise the Branch in terms of Mr. Williams' suggestion.

*Wheat Classes at the Royal Agricultural and Horticultural Society's Show.*—A communication was received from the Royal Agricultural and Horticultural Society intimating that a revision of the classes of wheat for the March, 1922, Show was intended, and asking for an expression of opinion from Branches of the Agricultural Bureau as to what was the most profitable wheat grown in South Australia. On the motion of Col. Rowell, seconded by Mr. Wicks, it was decided to refer the matter to a committee consisting of Professor Perkins, and Messrs. W. J. Colebatch and F. Coleman, with power to act and deal with the question.

*Sheep Dipping Regulations.*—The Chief Inspector of Stock (Mr. T. H. Williams) brought under the notice of the Board the fact that many sheepowners were under the impression that the regulations under the Compulsory Dipping of Sheep Act had been suspended. Such was not the case. Owners were still compelled to dip their sheep, although he was pleased to be able to report that lice in sheep were not now nearly so numerous in the various saleyards.

The Returned Soldier Vinegrowers' Association protested against the importation into this State of potatoes from the phylloxera areas of Victoria. It was decided to transmit the communication to the Horticultural Instructor with a request for a report on the matter.

The Returned Soldier Vinegrowers' Association also asked that members of their Association should be supplied with copies of the *Journal of Agriculture* free on the same basis as members of the Agricultural Bureau. The Secretary was instructed to inform the Association that a large number of returned soldier vinegrowers were already members of the Agricultural Bureau and in receipt of a free

copy of the *Journal of Agriculture*. If there were a sufficient number of members of the Association in a district not served by a Branch of the Bureau, the Board would be pleased to give approval for the formation of a Branch.

*The Lucerne Flea.*—Mr. A. M. Dawkins reported that the advance guard of the grasshoppers had arrived at Gawler that morning, but there was one pest that was dreaded more than the locust. That was the lucerne flea. The locust was here to-day and gone to-morrow, but when once the lucerne flea came on to a property it became a permanent resident. The insect checked the germination of the young wheat plants and reduced the grazing capacity of the land by more than half, if not more. The Board decided to ask the Minister to have the matter investigated by an entomologist.

*Life Membership.*—The name of Mr. R. Shaw, of Crystal Brook, was added to the list of life members of the Agricultural Bureau.

*New Branches.*—Approval was given for the formation of a Branch of the Bureau at Block E (Renmark) with the following gentlemen as foundation members:—J. C. Brigham, A. R. Ninke, A. J. Lamey, F. C. Berrill, D. Kidd, P. E. Muspratt, W. S. Ricketts, J. S. Blackburn, W. A. Giles, T. F. Spurling, E. W. Williams, W. F. Gambil, O. Jungfer, A. W. Flaherty, G. Dunstan, W. B. Carr, H. Newstead, T. Charlewood, H. Lucas, O. R. Neighbour, L. D. Conway, J. Hennicker, — Fisher, — Moule, W. F. Edmunds, — Kubank, B. Weber. Approval was also given for the formation of a Branch at Pygery.

*Branch to be Closed.*—It was decided to close the Mundoora Branch.

*New Members.*—The following names were added to the rolls of existing Branches:—Tarcowie—F. C. Sweet, J. Breuer; Kalangadoo—J. B. Hastings, A. M. Cameron; Balhannah—W. Goodhart; Williams town—C. Harmer, J. H. Wilson, G. Tobit, W. Harmer; Naracoorte—W. P. McIntosh, M. Beaton; Morchard—J. Sandison; Windsor—K. J. Bubner, G. Clark, R. O. Williams, F. W. Pritchard; Tatiara—H. T. Exten, E. H. Fisher, H. G. Fisher, J. Elliott, T. G. Marshall, C. Campbell, R. H. Hunt, F. Satchell, L. Watson, J. C. G. Warnecken, L. Langley, C. S. Wylie, C. E. W. Virgo, W. Basford, C. G. Marshall, A. King, jun., D. Butler; Brentwood—E. J. Vanstone, F. Vanstone, H. Le Poidevin, E. Mulroney; Waikerie—E. T. Pascoe, F. Rainey, L. Thompson; Rendelsham—A. Orchard, T. A. Aberle; North Booborowie—G. Collins, R. Dawson; Red Hill—C. Matthews; Blackwood—W. Redman, J. L. Lane; Moorak—E. H. Kentish; Coorabie—R. Nicol, C. Oats; Virginia—P. Thompson, C. H. Modra, C. R. Hatcher, M. McCallum; Shoal Bay—J. H. Barnes; Balaklava—R. Harris; H. V. Roberts, jun., K. Tuck, H. Masters, J. H. Dewhirst, G. Langster; Renmark—G. Higgins, B. M. Edson, H. Little, T. Lucas, H. Michan, A. Seekhamp, A. R. Logan, P. Van Vetsen, W. N. Appleby, J. H. Carroll; Lucindale—L. G. Hunt, F. C. Copping; Nunkeri and Yurgo—A. Nicholls; Glossop—C. K. S. Johns, H. Schell, A. Quigley, H. H. Roe, A. Slocum, C. Jacobson, H. H. Bottom; Lyndoch—J. G. Kelly, A. W. Penfold; Cleve—Fahrndou; Winkie—J. A. Possingham, jun.,



H. J. Dowling; Morphett Vale—J. J. Bennett; Whyte-Yarcowie—F. McCauley; Wirrabara—J. H. Clark, J. Dunn; Port Broughton—Rev. A. Hemmings, S. Evans; Moonta—A. J. Lamshed; Williamstown—F. W. Trestrail; Collie—R. A. V. Starky, D. Gunn; Elbow Hill—A. Wardle, R. Gribble; Kongorong—J. Miller; Laura—F. Ellis; Balhannah—H. Rholbusch; Williamstown—A. Bain, W. Sizer; Monarto South—H. F. Rayson, Th. Tuestner, M. Thomas, E. Thomas; Owen—Jas. Freebairn, Geo. Freebairn, D. G. Healy, W. Jones, P. Wood, A. Bowyer, L. H. Bowyer, Wm. Baker, C. Baker, A. S. Evans, A. Freebairn, jun., T. A. Freebairn, H. Freebairn, R. S. Harkness, H. A. Helps, R. H. Hancock, Jas. Healy, F. A. Hill, S. C. Lacey, W. J. Marshman, B. Marshman, E. R. Marshman, C. L. Marshman, H. Moeller, — McPharlin, Allan March, W. J. Pavy, D. S. Shakley, V. H. Scott, W. J. Goodall; Warcowie—Wm. Snook, Ernest Jarvis, Edward Jarvis; Denial Bay—J. R. Poster, J.P. and E. A. Hastings, F. Dahl, S. Trewartha; Mypolonga—K. F. Dowding; Amyton—D. Corcoran; Beetaloo Valley—W. Petrie, jun., J. Thomas; Meadows—J. D. Hirschfield, A. J. Elliott; Watervale—F. Grace, jun., M. Grace; Cleve—Holland —; Wudinna—W. G. Tree, W. Sharman, R. R. Freer, R. Bennett, E. Simpson; Minnipa—W. F. Arthur, T. F. Scott; Rendelsham—M. L. Bradshaw, W. Andrews, A. Foster; Petina—W. Armour; Salisbury—J. C. Weatherill; Glossop—A. Barton; Ramco—T. Harden, J. Jamison; Ashbourne—G. Whittam; Winkie—R. R. Delaine; Mount Pleasant—P. B. Haensler; Maltee—L. M. Martin, H. J. Schwarz, C. S. Schwarz, J. O. Shorne, J. W. Bassham, W. W. Barnett, E. D. Barnett, J. B. Talbot, R. Edson; Rockwood—C D. Scott, E. D. Scott; Wilkawatt—J. H. Tylor; Blyth—A. G. Burgess; Williamstown—G. M. Bain.

## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, January 11th, there being present Mr. C. J. Tuckwell (Chairman), Professor Arthur J. Perkins (Director of Agriculture), Mr. W. J. Colebatch (Principal of the Roseworthy Agricultural College), Capt. S. A. White, Messrs. T. H. Williams, H. Wicks, F. Coleman, A. M. Dawkins, W. S. Kelly, and the Secretary (Mr. H. J. Finnis). An apology was received from Mr. W. G. Auld.

*Protest against Importation of Potatoes.*—A communication was received from the Returned Soldier Vinegrowers' Association protesting against the importation of potatoes from the phylloxera infested areas of Victoria. The matter was referred to the Horticultural Instructor (Mr. Geo. Quinn), who reported as follows:—"All potatoes imported from adjoining States must bring a certificate that they have been inspected and are free from prohibited diseases. Further, this department must have a declaration from every grower of potatoes in Victoria, countersigned by an inspector of the Department of Agriculture, who has visited the property at least once each

year, stating that no vines are grown within 50 yards of the potato plots or fields. Further, each grower's name and address or registered brand must be branded on each bag of potatoes he sends to this State, and such brands are stated on the accompanying certificates. Further, potatoes are only grown in commercial quantities in Victoria in non-vinegrowing areas, and we have no record of any having been received here from districts in which phylloxera is recorded." The Secretary was instructed to advise the association in terms of Mr. Quinn's report.

*The Dairying Industry.*—A draft copy of the proposed Bill dealing with the Dairy Industry was received from the Hon. Minister of Agriculture. The Chairman (Mr. C. J. Tuckwell) and Mr. F. Coleman were appointed as a subcommittee to give consideration to the Bill and submit a report to the Board.

*Popularity of Different Varieties of Wheat.*—The Royal Agricultural and Horticultural Society asked that the opinion of Branches of the Agricultural Bureau situated in the wheatgrowing areas of the State might be ascertained as to the most profitable wheat grown in South Australia. On the motion of Mr. A. M. Dawkins, seconded by Mr. W. S. Kelly, the Director of Agriculture (Professor Arthur J. Perkins, Mr. F. Coleman, and the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch) were appointed as a committee to inquire into and report on the matter.

*Compulsory Spraying of Orchards.*—The 1921 Conference of River Murray Branches of the Agricultural Bureau carried the following resolution:—"That spraying of all pear, quince, apple trees, and vines be made compulsory, and that a salaried officer be appointed to supervise the work, and that legislation be introduced to allow of the formation of local boards to control operations." The Horticultural Instructor (Mr. Geo. Quinn) furnished a report on this matter, which was duly submitted to the Board (*see Journal of Agriculture*, August, 1921). Other fruitgrowing districts in non-irrigable areas were subsequently asked for an expression of opinion, and these having been received, the Board decided to ask Messrs. H. Wicks and W. G. Auld to supply a report on the question.

*Registration of Bulls and Stallions.*—The following resolutions dealing with this matter were received from the undermentioned sources:—(1) Annual Congress—"That this Congress is in favor of the Government bringing in an Act to provide that all owners of stallions and bulls should register their animals under the same conditions as obtains under the Victorian Act." Salisbury Branch—"That it should be compulsory to register bulls and stallions." Eyre Peninsula Conference—"That the Advisory Board be asked to investigate the possibility of encouraging the use of high quality stallions amongst farmers by subsidising owners who are prepared to let their horses to neighbors at reasonable fees." On the motion of Mr. W. J. Colebatch, seconded by Capt. White, it was decided to forward the Congress resolution to the Minister of Agriculture with the strong support of the Board, in so far as the registration of stallions was concerned.

*Imperial Preference for Dried Fruit.*—The thirty-second Annual Congress resolved—"That steps should be taken to secure Imperial preference for dried fruits." The resolution originated from the Renmark Branch, who in a further communication point out that, chiefly owing to the heavy planting of drying varieties of vines in South Australian and Victorian State irrigation areas, at least a further 10,000 tons of dried fruit will be produced by 1925, and that the export proportion by that date will be at least 60 per cent., and that in the years immediately following the export will be nearer 80 per cent. In view of the probable return of world's parity of dried fruit to something approaching pre-war figures, this Branch requests the Advisory Board to endeavor to obtain a substantial preference from the British Government, and to guarantee a grant of unimproved lands suitable to irrigated dried fruit culture to the British Government, as a *quid pro quo*. The Board decided to forward the matter to the Government, supporting the request to seek Imperial preference to the importation of dried fruit into Great Britain.

*Resolutions from Murray Mallee Lands Bureau Conference.*—(1) "That this Conference ask the Railways Commissioner to increase the time allowed for loading trucks in this district from three to eight hours," and "That the Railways Commissioner be asked to keep his promise to provide residents of the Peebinga line with a rake of trucks when ordered." The Secretary was instructed to forward the resolution to the Railways Commissioner, at the same time pointing out the peculiar difficulties under which farmers in those districts were laboring, and request that the settlers should be given every consideration. (2) "That the Advisory Board approach the Government with a view to their undertaking steps to find a market for cured pork." It was decided to bring the matter under the notice of the Government.

*Destruction of Rats, Dingoes, Foxes, and Rabbits.*—A communication was received through the Department of Trade and Customs suggesting methods for the destruction of the above-mentioned vermin.

*Foul Brood in Bees.*—A communication was received from an apiarist at Bundaleer Springs notifying the Board of an outbreak of foul brood in bees in that district. On the motion of Mr. F. Coleman, seconded by Mr. H. Wicks, the Secretary was instructed to notify the Minister of the reported appearance of foul brood in the Bundaleer Springs district.

*Hay and Chaff Acts.*—The Chairman (Mr. C. J. Tuckwell) brought under the notice of the Board the annual report of the Horticultural Instructor (Mr. Quinn), wherein it was stated that, owing to the pressure of a multitude of other duties, little attention had been given to the enforcement of the provisions of the Sale of Fertilisers, Hay and Chaff, Fruit Cases, and Insecticides, &c., Acts. The report also pointed out that practically no inspectorial work of any moment had been accomplished under the Sale of Hay and Chaff Acts, and that the Sale of Fruit and Insecticides Acts had practically remained in abeyance, the former pending amendments and the latter owing to

lack of time to draw up regulations. On the motion of Mr. Wicks, seconded by Mr. A. M. Dawkins, it was resolved—"That the attention of the Minister be drawn to the report, and that he be informed 'the Board looks upon the state of affairs as reported by Mr. Quinn as unsatisfactory. The Board suggests that Mr. Quinn might be asked to furnish suggestions as to how the difficulties set out in his report might be overcome.

*Smut in Wheat.*—Mr. F. Coleman reported that in many of the wheat-growing districts there appeared to be a considerable increase of smut in wheat. During a recent trip to Yorke Peninsula quite a number of the crops showed very marked evidence of the disease. The occurrence of the disease, he believed, was due in no small degree to the ineffective methods of pickling adopted by many farmers. The disease could be prevented if farmers were more careful. He would like to draw the attention of Branches of the Bureau in the wheat-growing areas to the article on the subject by Mr. W. S. Spafford (Superintendent of Experimental Work) that appeared in the December issue of the *Journal*.

*Gassing Rabbits.*—Capt. White informed the Board of an effective method of destroying rabbits, by pumping fumes into the burrows, that had been brought under his notice. The opinion was expressed that if such a scheme was adopted, in preference to the use of the poison cart, the spread of the blowfly would be considerably reduced, as the rabbits would be killed in the burrows, and useful birds would not be destroyed, as was the case when the baits were left lying about. Mr. T. H. Williams also pointed out that if the fumigation method was universally adopted there would be no danger of animals being poisoned through chewing the bones of the dead carcasses.

*Destruction of St. John's Wort.*—The Chairman (Mr. C. J. Tuckwell) informed members that the noxious weed known as St. John's wort had made its appearance on a small area of land in the vicinity of Blackwood. On the motion of Capt. White, seconded by Mr. H. Wicks, it was resolved—"That the attention of the Commissioner of Crown Lands be drawn to the matter, and that the Board recommends that immediate steps should be taken to eradicate the weed."

*Honey Export Regulations.*—The Chairman (Mr. C. J. Tuckwell) also brought under the notice of the Board the regulations under the Commonwealth Commerce Act governing the export of honey. The Secretary was instructed to obtain a report from the Produce Department regarding the practicability of shipping honey in 60lb. tins for the overseas market.

*Afforestation.*—The Director of Agriculture (Professor Arthur J. Perkins), Capt. S. A. White, and Mr. F. Coleman were appointed as a Committee to wait on the Minister Controlling Forest Lands and explain the objects of the Advisory Board subcommittee appointed to inquire into the question of afforestation.

*New Branch.*—Approval was given for the formation of a Branch of the Bureau at Weavers, with the following gentlemen as foundation members:—J. D. and W. F. Latty, A. W., and J. Sheriff, A. P. Piggott, A. P., A. E., and E. Anderson, C. Jones, G. Bishop, G. and S. Brundell, G. Dodd, O. P. Jung, L. A. Slade.

*Branch to be Closed.*—It was decided to close the Pine Forest Branch.

*New Members.*—The following names were added to the rolls of existing Branches:—Barmora—A. H. Denison, W. P. Webb R. A. Warmley, J. Adcock; Balhannah—A. Peacock, jun., A. J. Peacock, A. Lange; Lone Pine—J. Till; Renmark—M. J. Tucker, T. Patterson; Meadows—R. Goodman; Coonalpyn—H. E. Potts, F. H. L. Field; Black Springs—W. Liebig, H. Gilbert; Wollowa—V. O. Stone; Port Elliot—C. Forest, A. Hosurley; Ashbourne—J. Dodd, jun.; Kongorong—D. Uphill, F. Cain; Winkie—H. H. Gray; Coorabie—T. J. Smart, A. W. Hardy, C. Tomney, A. Broadfoot; Hartley—R. T. Strawson.

## MURRAY BRIDGE HERD TESTING ASSOCIATION.

### RESULTS OF BUTTERFAT TESTS FOR OCTOBER, 1921.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.		Butterfat.	
			Per Herd during October.	Per Cow during October.	Per Herd during October.	Per Cow during October.
			Lbs.	Lbs.	Lbs.	Lbs.
1/A .....	13	11-68	9,630	740-77	445-85	34-30
1/C .....	26-16	23-55	22,415-5	856-86	979-82	37-45
1/E .....	14-65	12-77	9,067-5	618-94	407-53	27-82
1/G .....	48-94	38-06	41,233-5	842-53	1,556-58	31-81
1/I .....	10	7-35	8,169	816-90	329-75	32-98
1/J .....	16	10-97	10,229-5	639-34	418-37	26-15
1/K .....	14-03	12-84	9,914	706-63	437-88	31-21
1/L .....	13	12	7,843	603-31	401-78	30-91
1/M .....	17-48	14-55	7,985	456-81	385-25	22-04
1/O .....	29-77	26-10	20,197	678-43	926-13	31-11
1/R .....	16-68	16-45	6,888	412-95	328-85	19-72
1/S .....	16	14-94	10,604-5	662-78	466-15	29-13
1/T .....	12	7	5,006-5	417-21	236-38	19-70
1/U .....	14	8	6,370-5	455-04	289-97	20-71
1/V .....	16	12-68	7,813	488-31	342-78	21-42
<b>MEAN</b> .....	18-51	15-26	12,224-43	660-28	530-20	28-64

## THE AGRICULTURAL OUTLOOK.

*Kybyholite.*—Weather has been remarkably cool for the time of the year. Not much rain fell, about 40 points during the first week; but a lot of cool winds have prevailed. Crops—Weather has prolonged the gathering of grain crops. Yields are disappointing, there being plenty of chaff but light grain. Summer crops have made fair growth, especially turnips, which have provided an abundance of feed for spring-dropped lambs. Maize, under irrigation, has grown fairly well, but warmer weather would have suited it better. There is abundance of feed on the stubbles, and the oats wasted by the caterpillars are proving very useful to the sheep.

*Turretfield.*—Weather—The first fortnight of this month was exceptionally wet and altogether unseasonable, 142 points of rain being recorded. The balance of the month was cool, dewy mornings being prevalent. Some days were very windy. Crops—All reaping is finished, and the bulk of the hay is carted and stacked. The yield has been fairly good, although some hay is weighing light. Natural Feed—All natural feed is eaten, and stock are being placed on the stubbles. Stock in most cases are in good condition. Pests—Young grasshoppers are hatching out in patches. Starlings are very troublesome in the vineyards. Miscellaneous—Fallow is very dirty this year, dog weed, potato weed, and paddy melons giving much trouble.

*Veitch.*—Weather conditions dry and seasonable; 48 points of rain to date; Veitch average, 31. Have also experienced rather more winds than usual. Crops are nearly all harvested, and carting operations are going ahead. Veitch Siding will have 20,000 bags of wheat. Natural feed getting rather scarce, but stubble feed is now available. Stock—All in healthy condition. Pests—Dry weather has had a good effect on clearing out rabbits, and burrows are drifting in. Miscellaneous—A few farms are changing hands in the district, and land values are on the rise.

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## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on February 1st:—

**BUTTER.**—Early in the month of January a conference was held in Melbourne representing the trade interested in the dairying industry from all States, and negotiations were being made for the purchase of the surplus butter held by the Imperial Government; but in the meantime the trade of Great Britain had purchased the parcel, so that this had the effect of stabilising the market, values since then improving very much. Local supplies of choicest are becoming scarce, and small lots of importations are coming along to meet the demand. First grade to choicest factory and creamery in bulk, 1s. 3d. to 1s. 3½d.; second grades, 9d.; third grades, 7d.; best separators and dairies, 1s. to 1s. 2d.; fair quality, 10½d. to 11½d.; well-selected store and collectors', 9d. to 10d.; off-conditioned lots, down to 7½d.

**EGGS.**—Demand during the month has been very active, and all consignments coming forward have met with ready sales, values improving 2d. per dozen. At close of month fresh hen sold at 1s.; duck, 1s. 0½d. per dozen.

**CHEESE.**—Heavy quantities continue to come forward from the South-East, but it is pleasing to report that good demand still exists both for local and export trade, so that nice clearances are being effected. Values are firmer, range being from 6d. to 7d. for large to loaf.

**HONEY.**—New season's take is coming forward very freely, and all prime samples are meeting with speedy quittance at 3½d. to 4d. per lb. Second grades are slow of sale at 2d. per lb. Beeswax sold at 1s. 8d.

**ALMONDS.**—The crop is a very late one, consequently there are very few offering. Buyers are taking up any lots that are coming forward at—Brandis, 1s. 2d.; mixed softshells, 1s. 1d.; hardshells, 6d.; kernels, 2s. 3d.

**BACON.**—The turnover during the month has been fairly good, especially for sides and middles, which show an improvement in price. At end of period values were—Best factory-cured sides, 1s. 2d. to 1s. 2½d.; middles, 1s. 4d. to 1s. 5d.; hams, 1s. 6d.; lard, in bulk, 7½d; packets, 8d.

**LIVE POULTRY.**—As usual during the month of January supplies have been very short. This has been unfortunate, for the demand has been very brisk. All lots have sold at very satisfactory prices to consignors, and farmers would be wise in sending on their surplus stocks. At close of month values were:—Prime roosters, 4s. 9d. to 6s. 6d.; nice-conditioned cockerels, 3s. 6d. to 4s. 8d.; plump hens, 3s. 3d. to 5s.; medium hens, 2s. 6d. to 3s.; light hens, 1s. 9d. to 2s. 5d.; ducks, good quality, 4s. to 7s.; fair quality, 3s. to 3s. 11d.; geese, worth 5s. to 7s.; turkeys, prime conditioned, 1s. 3d. to 1s. 9d. per lb.; fair conditioned, 1s. to 1s. 2½d.; fat-tening sorts, lower; pigeons, 6d.

**POTATOES.**—The production of potatoes in Australia this season appears to be exceptional, and market rates ruling at present are lower than they have been for very many years. Values at moment in truck lots at Mount Gambier are £3 7s. 6d. per ton for best-quality Pinkeyes, to £4 10s. per ton for Carmens and Up-to-dates; £5 to £7 per ton for best-quality locals on trucks, Mile End. **ONIONS.**—£6 10s. to £7 10s. per ton on rails, Mile End.

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of January 1922, also the average precipitation to the end of January, and the average annual rainfall.

Station.	For Jan., 1922.	A'v'ge to end Jan., 1922.	A'v'ge. Annual Rainfall	Station.	For Jan., 1922.	A'v'ge. to end Jan., 1922.	A'v'ge. Annual Rainfall
<b>FAR NORTH AND UPPER WORTH.</b>				<b>LOWER NORTH—continued.</b>			
Oodnadatta .....	0.04	0.73	4.83	Spalding .....	1.10	0.53	20.33
Marree .....	0.05	0.48	6.10	Gulnare .....	1.38	0.58	19.23
Farina .....	—	0.58	6.73	Yacka .....	0.85	0.48	15.34
Copley .....	0.03	0.68	8.45	Koolunga .....	0.97	0.56	15.79
Beltana .....	0.10	0.74	9.01	Snowtown .....	1.05	0.57	15.95
Blinman .....	0.12	1.05	12.62	Brinkworth .....	0.70	0.41	16.16
Tarcoola .....	—	0.37	7.59	Blyth .....	0.91	0.64	16.75
Hookina .....	0.27	0.66	13.30	Clare .....	1.66	0.83	24.61
Hawker .....	0.28	0.62	12.72	Mintaro .....	1.56	0.53	23.26
Wilson .....	0.20	0.69	12.33	Watervale .....	2.13	0.85	27.41
Gordon .....	0.31	0.66	11.05	Auburn .....	1.88	0.96	24.25
Quorn .....	0.86	0.69	14.00	Hoyleton .....	1.34	0.74	17.79
Port Augusta .....	0.15	0.55	9.54	Balaklava .....	0.85	0.68	15.87
Port Augusta West .....	0.08	0.51	9.53	Port Wakefield .....	0.79	0.55	13.19
Bruce .....	0.62	0.47	10.40	Terowie .....	0.92	0.70	13.67
Hammond .....	0.90	0.04	11.61	Yarcowie .....	0.98	0.71	14.06
Wilmington .....	0.87	0.87	18.17	Hallett .....	0.89	0.70	16.37
Willowie .....	0.78	0.48	12.16	Mount Bryan .....	1.03	0.46	16.54
Melrose .....	0.99	1.25	23.21	Burra .....	0.93	0.75	17.96
Booleroo Centre .....	0.86	0.80	15.53	Farrell's Flat .....	0.90	0.72	18.90
Port Germein .....	0.48	0.63	12.79	<b>WEST OF MURRAY RANGE.</b>			
Wirrabara .....	1.43	0.68	19.62	Manoora .....	1.02	0.52	18.63
Appila .....	1.03	0.63	14.98	Saddleworth .....	1.21	0.74	19.70
Cradock .....	0.25	0.63	11.18	Marrabel .....	1.20	0.69	19.55
Carrieton .....	0.45	0.79	12.63	Riverton .....	1.08	0.75	20.66
Johnburg .....	0.66	0.61	10.50	Tarlee .....	0.94	0.76	17.76
Eurelia .....	0.56	0.76	13.36	Stockport .....	1.03	0.74	16.34
Orroroo .....	0.57	1.03	13.57	Hamley Bridge .....	1.32	0.77	16.45
Nackara .....	0.65	0.67	11.33	Kapunda .....	1.06	0.83	19.80
Black Rock .....	0.52	0.73	12.51	Freeling .....	1.30	0.73	17.83
Ucolta .....	0.53	0.74	11.90	Greenock .....	1.55	0.73	21.56
Peterborough .....	0.76	0.82	13.43	Truro .....	0.96	0.69	20.07
Yongala .....	0.84	0.65	14.41	Stockwell .....	1.06	0.69	20.24
<b>LOWER NORTH-EAST.</b>				Nuriootpa .....	1.57	0.74	20.94
Yunta .....	0.27	0.71	8.75	Angaston .....	2.05	0.73	22.44
Waukaringa .....	0.29	0.56	8.41	Tanunda .....	2.22	0.81	22.17
Mannahill .....	0.40	0.73	8.54	Lyndoch .....	1.85	0.70	22.81
Cockburn .....	0.22	0.68	8.22	Williamstown .....	2.11	0.85	27.52
Broken Hill, N.S.W. .....	0.22	0.75	9.91	<b>ADELAIDE PLAINS.</b>			
<b>LOWER NORTH.</b>				Mallala .....	1.12	0.72	16.58
Port Pirie .....	0.16	0.60	13.36	Roseworthy .....	1.10	0.70	17.27
Port Broughton .....	0.59	0.58	14.18	Gawler .....	1.12	0.71	19.08
Bute .....	0.89	0.59	15.65	Two Wells .....	1.14	0.68	15.85
Laura .....	1.43	0.69	18.16	Virginia .....	1.41	0.69	17.32
Caltowie .....	1.25	0.66	17.07	Smithfield .....	1.06	0.46	17.16
Jamestown .....	1.20	0.64	17.74	Salisbury .....	1.49	0.70	18.49
Bundaleer W. Wks. .....	1.15	0.63	17.89	North Adelaide .....	3.60	0.71	22.09
Gladstone .....	1.41	0.63	16.13	Adelaide .....	2.22	0.70	21.03
Crystal Brook .....	1.50	0.62	15.74	Glenelg .....	1.82	0.58	18.37
Georgetown .....	1.57	0.65	18.44	Brighton .....	1.46	0.55	21.24
Narridy .....	0.77	0.55	16.41	Mitcham .....	3.57	0.79	23.92
Redhill .....	0.86	0.53	16.75	Glen Osmond .....	2.83	0.93	25.74
				Magill .....	3.15	0.77	25.27



## RAINFALL—continued.

Station.	For Jan., 1922.	Av'ge. to end Jan., 1922.	Av'ge. Annual Rainfall
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## MOUNT LOFTY RANGES.

Teatree Gully .....	2.92	0.72	27.77
Stirling West .....	6.78	1.40	46.62
Uraidla .....	6.53	1.20	44.06
Clarendon .....	4.69	1.07	32.98
Morphett Vale ....	1.99	0.74	22.76
Noarlunga .....	1.34	0.58	20.27
Willunga .....	4.31	0.71	25.87
Aldinga .....	2.91	0.48	20.24
Myponga .....	2.41	0.36	28.44
Normanville .....	2.39	0.53	20.51
Yankalilla .....	3.36	0.47	22.99
Mount Pleasant ...	3.03	0.79	27.04
Birdwood .....	2.59	1.01	29.26
Gumeracha .....	3.39	1.03	33.25
Millbrook Reservoir	3.71	—	—
Tweedvale .....	4.01	0.95	35.54
Woodside .....	4.59	0.91	32.08
Ambleside .....	5.50	0.98	34.62
Nairne .....	3.02	0.90	28.43
Mount Barker .....	4.55	0.98	31.13
Echunga .....	4.14	1.01	32.91
Macclesfield .....	3.50	0.82	30.53
Meadows .....	4.96	0.95	36.04
Strathalbyn .....	1.66	0.67	19.26

## MURRAY FLATS AND VALLEY.

Meniglie .....	1.04	0.63	18.66
Milang .....	1.22	0.62	15.42
Langhorne's Bridge	1.34	0.42	14.55
Wellington .....	0.97	0.73	14.68
Tailom Bend .....	0.64	0.37	14.11
Murray Bridge .....	0.56	0.56	13.83
Callington .....	0.99	0.67	15.37
Mannum .....	0.42	0.50	11.52
Palmer .....	0.78	0.39	15.24
Sedan .....	0.27	0.51	12.13
Swan Reach .....	0.30	0.33	10.82
Blanchetown .....	0.09	0.52	10.16
Eudunda .....	0.65	0.69	17.50
Sutherlands .....	0.09	0.31	10.12
Morgan .....	0.36	0.45	9.18
Waikerie .....	0.34	0.24	9.68
Overland Corner...	0.26	0.48	11.08
Loxton .....	0.87	0.39	12.58
Renmark .....	0.51	0.43	11.02

## WEST OF SPENCER'S GULF.

Eucla .....	0.58	0.60	10.02
White Well .....	0.36	0.44	9.10
Fowler's Bay .....	0.50	0.39	12.19
Penong .....	0.58	0.32	12.25
Murat Bay .....	—	0.24	10.32
Smoky Bay .....	0.41	0.29	10.92
Petina .....	1.10	0.31	13.05
Streaky Bay .....	0.60	0.44	15.11
Talia .....	0.94	0.25	15.38
Port Elliston .....	0.74	0.38	19.53
Cummins .....	0.95	—	11.52

Station.	For Jan., 1922.	Av'ge. to end Jan., 1922.	Av'ge. Annual Rainfall
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## WEST OF SPENCER'S GULF—continued.

Port Lincoln .....	1.10	0.57	19.75
Tumby .....	0.63	0.20	14.62
Carrow .....	0.24	0.26	14.64
Arno Bay .....	0.81	0.24	13.08
Cowell .....	0.17	0.43	11.52
Minnipa .....	0.94	—	—

## YORKE PENINSULA.

Walleroo .....	0.41	0.54	14.09
Kadina .....	0.71	0.48	15.93
Moonta .....	0.62	0.50	15.25
Green's Plains .....	0.94	0.47	15.72
Maitland .....	2.15	0.57	20.05
Ardrossan .....	1.22	0.48	13.95
Port Victoria .....	1.17	0.44	15.35
Curramulka .....	2.08	0.55	18.16
Minlaton .....	2.20	0.47	17.79
Brentwood .....	1.82	0.28	15.54
Stansbury .....	2.19	0.57	16.96
Warooka .....	2.01	0.41	17.69
Yorketown .....	1.38	0.45	17.22
Edithburgh .....	1.62	0.48	16.53

## SOUTH AND SOUTH-EAST.

Cape Borda .....	0.95	0.62	25.01
Kingscote .....	1.33	0.42	19.02
Ponneshaw .....	1.07	0.28	18.97
Victor Harbor .....	1.72	0.69	21.40
Port Elliot .....	1.45	0.64	20.03
Goolwa .....	0.76	0.64	17.83
Meribah .....	0.42	—	—
Mindarie .....	0.31	—	—
Karoonda .....	0.72	—	—
Pinnaroo .....	0.55	0.34	15.32
Parilla .....	0.82	0.36	14.39
Lameroo .....	1.32	0.49	16.27
Parrakie .....	0.62	0.34	14.27
Geranium .....	0.52	0.35	15.96
Peake .....	0.50	0.44	15.91
Cooke's Plains .....	0.58	0.50	14.84
Coomandook .....	0.89	0.45	17.31
Coonalpyn .....	0.41	0.67	17.44
Tintinara .....	0.34	0.45	18.54
Keith .....	0.28	0.32	18.19
Bordertown .....	0.55	0.75	19.44
Wolsley .....	0.53	0.58	18.06
Frances .....	0.71	0.68	19.78
Naracoorte .....	0.89	0.80	22.46
Penola .....	0.43	1.03	26.36
Lucindale .....	0.08	0.70	22.01
Kingston .....	2.03	0.70	24.44
Robe .....	2.32	0.76	24.58
Beachport .....	2.24	0.86	27.27
Millicent .....	1.67	0.95	29.37
Kalangadoo .....	1.12	—	—
Mount Gambier ...	1.13	1.37	31.46

## AGRICULTURAL BUREAU REPORTS.

## INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings		Branch.	Report on Page	Dates of Meetings.	
		Feb.	Mar.			Feb.	Mar.
Alawoona .....	*	—	—	Elbow Hill .....	*	18	18
Aldinga .....	*	—	—	Eurelia .....	628	—	—
Amyton .....	*	—	—	Frances .....	*	25	25
Angaston .....	*	—	—	Freeling .....	*	—	—
Appila-Yarrowie .....	*	—	—	Gawler River .....	*	13	13
Arthurton .....	*	—	—	Georgetown .....	*	11	11
Ashbourne .....	665	—	—	Geranium .....	*	25	25
Balaklava .....	*	11	11	Gladstone .....	*	11	11
Balhannah .....	662-6	10	10	Glencoe .....	*	—	—
Barmera .....	660	7	7	Glossop .....	652	8	1
Beetaloo Valley .....	630	10	—	Goode .....	*	15	15
Belalie North .....	*	11	11	Green Patch .....	*	6	13
Berri .....	660-1	15	15	Gumeracha .....	663	13	13
Big Swamp .....	*	—	—	Halidon .....	*	—	—
Blackheath .....	666	11	11	Hartley .....	*	—	—
Black Springs .....	643	—	—	Hawker .....	*	14	14
Blackwood .....	*	20	20	Hilltown .....	*	—	—
Block E. ....	*	—	—	Hookina .....	628	9	9
Blyth .....	631-4	11	11	Inman Valley .....	*	—	—
Booleroo Centre .....	640	10	10	Ironbank .....	*	11	11
Borrika .....	*	—	—	Julia .....	*	—	—
Bowhill .....	*	—	—	Kadina .....	*	—	—
Brentwood .....	644	9	9	Kalangadoo .....	*	11	11
Brinkley .....	*	11	11	Kanmantoo .....	*	11	11
Bundaleer Springs ..	*	—	—	Keith .....	*	—	—
Burra .....	*	—	—	Ki Ki .....	*	—	—
Bute .....	*	7	7	Kilkerran .....	*	9	9
Butler .....	*	—	—	Kimba .....	*	—	—
Cadell .....	*	—	—	Kingscote .....	*	—	—
Caltowie .....	*	—	—	Kingston-on-Murray.	*	—	—
Canowie Belt .....	*	—	—	Kongorong .....	*	9	9
Carrow .....	*	9	9	Koonibba .....	*	9	9
Cherry Gardens .....	663	7	7	Koppio .....	*	6	13
Clanfield .....	*	—	—	Kybybolite .....	*	9	9
Clare .....	*	—	—	Lake Wangary .....	*	11	11
Clarendon .....	*	6	13	Lameroo .....	*	—	—
Claypan Bore .....	*	15	15	Laura .....	*	10	10
Cleve .....	644	8	8	Leighton .....	*	—	—
Collie .....	*	—	—	Lenswood and Forest	*	25	25
Colton .....	*	24	31	Range .....	*	—	—
Coomandook .....	*	24	—	Lone Gum .....	661	8	15
Coonalpyn .....	650	10	10	Lone Pine .....	640-2	—	—
Coonawarra .....	*	—	—	Longwood .....	664	—	—
Coorabie .....	645	—	—	Loxton .....	*	—	—
Craddock .....	*	—	—	Lucindale .....	671	—	—
Crystal Brook .....	*	11	11	Lyndoch .....	643	—	—
Cummins .....	*	11	11	MacGillivray .....	*	8	8
Cygnat River .....	*	9	9	McLachlan .....	*	—	—
Dawson .....	*	—	—	Maitland .....	*	4	4
Denial Bay .....	*	—	—	Mallala .....	*	6	6
Dowlingville .....	†	—	—	Maltee .....	†	—	—
Edillilie .....	*	25	25	Mangalo .....	*	—	—

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Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Feb.	Mar.			Feb.	Mar.
Meadows .....	†	8	8	Rendelsham .....	670	8	8
Meningie .....	*	—	—	Renmark .....	*	—	—
Meribah .....	†	—	8	Riverton .....	*	—	—
Milang .....	†	11	11	Riverton (Women's) ..	*	—	—
Millicent .....	†	4	4	Roberts and Verran ..	646	6	6
Miltalie .....	649	11	11	Rockwood .....	664	13	13
Mindarie .....	*	6	6	Rosedale .....	*	—	—
Minlaton .....	*	10	10	Rosy Pine .....	656	—	—
Minnipa .....	650	8	8	Saddleworth .....	*	—	—
Mintaro .....	*	11	11	S a d d l e w o r t h	*	—	—
Monarto South .....	661-2	11	11	(Women's) .....	*	—	—
Moonta .....	644	—	10	Salisbury .....	*	7	7
Moorak .....	671	9	9	Salt Creek .....	*	—	—
Moorlands .....	*	—	—	Sandalwood .....	*	—	—
Moorook .....	*	—	—	Shoal Bay .....	*	—	—
Morchard .....	*	11	11	Smoky Bay .....	650	—	—
Morgan .....	*	—	—	Spalding .....	*	—	—
Morphett Vale .....	*	9	9	Stockport .....	*	—	—
Mount Barker .....	*	8	8	Strathalbyn .....	*	7	7
Mount Bryan .....	640	—	—	Talia .....	*	13	13
Mount Byran East ..	635	—	—	Tantanoola .....	671	11	11
Mount Compass .....	*	—	—	Taplan .....	*	18	18
Mount Gambier .....	666	11	11	Tarcowie .....	628	7	7
Mount Hope .....	650	11	11	Tatiara .....	671	18	18
Mount Pleasant .....	664	—	—	Two Wells .....	†	—	—
Mount Remarkable ..	*	—	—	Uraidla & Summertown	*	6	6
Mundalla .....	*	8	8	Veitch .....	*	—	—
Murray Bridge .....	*	—	—	Virginia .....	*	—	—
Mypolonga .....	662	—	8	Waikerie .....	*	—	—
Myponga .....	*	—	—	Wall .....	*	—	—
Nantawarra .....	*	9	9	Wanbi .....	*	—	—
Naracoorte .....	667	—	—	Warcowie .....	†	—	—
Narridy .....	*	11	12	Watervale .....	643	—	—
Narrung .....	*	11	11	Whyte-Yarcowie .....	638	—	—
Neeta .....	*	—	—	Wilkawatt .....	662	—	11
Netherton .....	662	—	—	Williamstown .....	643	1	1
North Booborowie ..	†	—	—	(Women's) .....	*	—	—
North Bundaleer .....	*	—	—	Williamstown .....	643	10	10
Northfield .....	*	8	8	Willowie .....	†	—	8
Nunkeri and Yurgo ..	*	6	5	Wilmington .....	628	8	8
O'Loughlin .....	*	8	8	Windsor .....	*	—	—
Orroroo .....	*	—	—	Winkie .....	657-60	—	—
Owen .....	*	—	—	Wirrabara .....	639-40	—	—
Parilla .....	*	—	—	Wirrega .....	671	—	—
Parilla Well .....	*	13	13	Wolowa .....	*	—	—
Parrakie .....	*	—	—	Wudinna .....	650	—	—
Paruna .....	*	—	—	Wynarka .....	*	—	—
Paskeville .....	*	7	7	Yabmana .....	*	—	—
Penola .....	669	4	4	Yacka .....	*	7	7
Petina .....	*	25	25	Yadnarie .....	648	8	8
Pinnaroo .....	*	10	10	Yallunda .....	*	—	—
Pompoota .....	*	—	—	Yaninee .....	*	—	—
Port Broughton .....	*	10	10	Yeelanna .....	649	—	11
Port Elliot .....	664-6	11	11	Yongala Vale .....	*	10	—
Port Germein .....	*	18	18	Yorketown .....	*	—	—
Ramco .....	662	6	16	Younghusband .....	*	9	16
Redhill .....	636-8	—	—				

\* No report received during the month of December. † Recess. ‡ Held over until next month.  
‡ Formal meeting.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

HOOKINA (Average annual rainfall, 12in.).

December 15th.—Present: seven members and visitors.

**BEST WHEATS FOR THE DISTRICT.**—Mr. S. Stone said the best wheats for any particular district could only be ascertained by careful and practical experiments with different varieties carried out over a number of years. The three kinds that were best suited for general commercial purposes in that district were King's Early, Federation, and Dart's Imperial. King's Early was a good hay wheat that matured early and it could be cut and stacked in time to commence the harvesting of the later varieties. It was advisable to cut most of that wheat for hay, as it had a tendency to "go down" badly in rough weather. Federation, a mid-season variety, was undoubtedly the most profitable to grow for wheat purposes, as it yielded heavy crops, and was seldom affected by any kind of disease. It was not a good hay wheat, as it did not produce any great quantity of straw or flag. It was a variety that would always stand up well in rough weather. Dart's Imperial was a good late wheat, being a heavy yielder and producing hay of excellent quality. In a favorable season it grew to a great height, and was not often affected by rough weather. Mr. Stone also read an article dealing with experiments that had been conducted for the destruction of blowflies.

WILMINGTON (Average annual rainfall, 18.26in.).

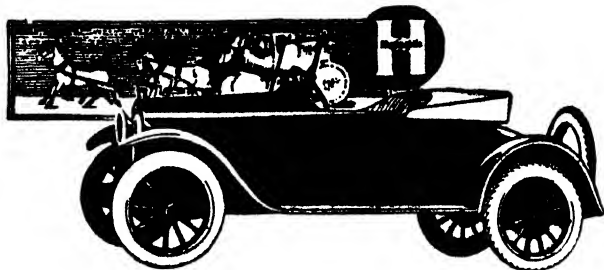
November 23rd, 1921.—Present: seven members.

**EXAMINATION OF CATTLE FOR INFECTIOUS DISEASES.**—In the course of a short paper, under the title "Certifying Cattle as Sound for Shows, &c.," Mr. H. Duhring said everybody recognised the importance of granting certificates of soundness to stallions, but he would like to see a similar scheme adopted whereby cattle, and particularly cows, should be certified as to good health before being exhibited in the show ring, or using milk, cream, or butter, and beef therefrom. It was gratifying to know that the Government were doing all that was possible to discover a remedy for cancer, but, in his opinion, it was not right that after a wound had healed on a beast that had been operated upon for cancer that that animal should be killed for human consumption. In the discussion that followed it was decided to bring the matter under the notice of the Advisory Board.

**EURELIA, January 13th.**—A special meeting of the Branch was convened to give consideration to matters relating to the forthcoming conference of Upper Northern Branches. Other matters, including the subject "Destruction of Locusts," were brought before the members.

**TARCOWIE, November 19th, 1921.**—Mr. H. H. Edwards read a paper, "Some Tricks of the Horsedealer," and an interesting discussion followed, in which Messrs. J. Smith and W. S. Ninnes took part.

**TARCOWIE, December 21st.**—A special meeting of the Branch was called to give consideration to the question "Which is the Most Profitable Wheat Grown in the District." Other subjects brought before members were "Immigration of Boys for Farm Work" and "Methods of Combating the Locust Plague."



# HUPMOBILE

THAT'S THE CAR FOR YOU!

## WE BELIEVE

the Hupmobile to be the best Car of its class in the world, but as you might think we are prejudiced, we invite you to read what other people say about the Comfort Car.

## HILL CLIMBING—

Dr. A. R. Fletcher, of Blackwood, writes:—"The Hupmobile I had from you has now done over 20,000 miles, and is going as well as ever. In proof of this, it is still her habit to come from Bedford Park to the top of Shepherd's Hill by the nearest road on top gear, which, in the estimation of my friends, is a very fine performance, especially as she repeats it day after day."

## RELIABILITY—

Mr. S. H. Ayers, of Warenda, Clare, writes:—"I have recently returned from a 1,400 miles motoring trip through New South Wales and Victoria, and I would like to mention that I am more than pleased with the way the Hupmobile responded to all that was asked of it. I had no engine worries, and the car was very easy on tires."

## ECONOMY—

Mr. Charles W. Hall, of Loxton, writes:—"I have no complaints to make about the Hupmobile I purchased from your firm, and she holds her own amongst all the cars here. I averaged 24 miles to the gallon coming up from Adelaide."

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# HUPMOBILE

## MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 23.50in.).

November 9th, 1921.—Present: 12 members and three visitors.

**BEST METHOD OF FARMING FOR THE DISTRICT.**—In the course of a paper dealing with this subject Mr. F. Bartrum said lessons in the hard school of experience had taught the majority of farmers that the bare fallow system was the most reliable method of working the land for wheat production. Of course, in some seasons, good catch crops were taken from the stubble land, but on the average that method of cultivation was of an uncertain nature. Fallowing should be commenced as soon after seeding as possible, and the land then cross-harrowed with a set of medium-weighted sharp harrows to break the lumps and assist in the germination of the weed seeds. For the first working he suggested the use of the spring-tyne cultivator. That implement left the land in a nice loose condition. If stinkwort or Salvation Jane were growing on the fallow a skim or disc plough should be brought into operation. After the final cultivation the land should be harrowed to conserve moisture. Working the land in the summer should, if possible, be avoided, as that practice usually left the soil in a rough condition, and also encouraged the growth of take-all. The harrows could be used with advantage during the summer on those occasions when sufficient rain fell to make the ground moist. The selection of good clean seed was an item that did not receive sufficient attention from the majority of farmers. The seed should be free from smut, graded to remove all inferior grains, and make a more uniform sample for sowing through the drill. In that district the mid-season varieties of wheat were, as a rule, the heaviest yielders of grain, but where a fairly large area was put under crop it was advisable to sow, in addition, a couple of the early varieties, so that an early start could be made with the reaping, and the hay carted in before the bulk of the crop was ready for harvesting. Florence, in his opinion, was a good all-round variety and the best of the early wheats. It was also an excellent hay wheat, but it was somewhat inclined to "shell" badly if rough weather was experienced when the heads were full and ripe. A strong point in its favor was that it was practically smut-proof, and did not require pickling. Gluyas also yielded good returns, but the seed of that variety should not be sown too early, as there was a danger of it going down badly. Of the late varieties Marshall's No. 3, Currawa, Federation, and Daphne all yielded good returns if sown on clean land. Currawa should not be sown on land infested with wild oats, for the oats were inclined to rub against the wheat and pull the heads off. All seed should be pickled, and when time permitted he preferred treating the seed with a solution of 1lb. of bluestone to 10galls. of water on a floor and turning it backwards and forwards with a shovel. For the early varieties a sowing of 90lbs. of seed would be found to give the best returns, and for the later wheats he recommended from 75lbs. to 80lbs. of seed to the acre, and 1cwt. of super to the acre. He also suggested sowing sufficient oats for the feeding of the stock and a few acres of barley for the pigs. When the crop was well above the ground that portion that had been selected for cutting for hay should be rolled with a heavy roller.

**COLT BREAKING.**—Mr. J. Richards, who contributed a short paper on this subject, said the first work in preparation for breaking in the colt was the erection of a strong post-and-rail fence about 6ft. or 7ft. high, with a post in the centre of the enclosure, to which the animal could be fastened. After the colt had been mouthed, the real operation of handling commenced. The temper of the young horse should be studied, and if he was inclined to be wild it was most important that he should be treated with patience and kindness; but at the same time he should be made to understand that the person breaking him in was his master. After a couple of days' handling, the colt would, in most cases, permit himself to be caught. The colt could then be worked in the shafts of the dray, but it was important that the leaders should be reliable and quiet horses. A rope should be placed around the neck of the young animal and fastened to the spreaders of the leader so that he could not run back or break away. Another useful

practice was to harness the colt to a log and allow him to pull it about for some little while, after which he could be harnessed next to the off-side horse of the team working a cultivator or plough. In order to guard against any possibility of his breaking away it was advisable to fasten him with a rope around the neck to the next horse. The Branch decided to go into recess until the February meeting.

BLYTH (Average annual rainfall, 16.46in.).

October 29th, 1921.—Present: 12 members and five visitors.

**CARE OF FARM MACHINERY.**—The following paper was read by Mr. E. H. Lanyon:—The high cost of machinery should make the farmer ask himself if he is giving his plant the care it should receive. All implements should be kept under shelter when not in use, and the cost of a shed would be saved in a short time by the extended life of the plant. In my opinion a straw roof is to be preferred to iron, as it keeps a more even temperature, which is of great value where woodwork is to be preserved. The sides should also be closed up, as the driving rain will soon play mischief with the machines. More attention should be paid in putting in a strong floor and keeping it level, as the uneven surface of the ground will have a tendency to throw the machines out of shape, more especially those with any great amount of woodwork. Timber exposed to heat and rain is subjected to excessive shrinking and swelling, which should be avoided. Vehicles and implements should be kept painted more for preservation than decoration, and if done by an experienced tradesman a better result will be gained.

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The vehicles on the farm require careful attention, the most vital parts being the wheels. The exclusion of moisture from the woodwork is most essential, and if no other part of the vehicle is treated the wheels should be always well painted. The tyres should be examined, and always kept tight, as running with a loose tyre causes much damage to the felloes or rims of the wheels, incurring extra expense in replacing them. It is also advisable to note the spokes and naves. A wheel may become "felloe-bound" through the nave and spokes shrinking, and the centre becomes loose, whilst the tyre remains perfectly tight. A "talking" wheel is usually traced to this source. In purchasing a vehicle it is always advisable to stipulate the thickness of tyre as well as the width, and secure a tyre that will withstand the load and strengthen the wheel. A thin tyre will always cause damage to the wheel, and be a source of expense to the owner. The provision of a thicker tyre on the rear wheels is advisable in hilly country, where any great amount of skid work is anticipated, as a larger amount of wear is caused by the skid than the road work. Good lubrication is also necessary, and it is advisable to always procure the best grease and oils, as the difference is small in the cost of good and inferior lubricants. A hot axle box will cause delay and inconvenience, and probably a damaged axle. Should an axle box run hot whilst using good grease, there are several points to note that may cause it. They are, first, the wheel may be washered too tightly, and the washers need easing; second, the axle box may work loose in the nave and need repacking; third, the box may be out of true with the wheel and need reboxing; fourth, the axle arm may be out of alignment. This should be referred to the blacksmith for testing and correct setting. The axle may be strained by overloading or the striking of a stump, stone, or rut whilst the vehicle is loaded. Keep all bolts screwed up, and broken ones replaced, and the life of the vehicle will be lengthened. Have any weak or damaged timber removed before it causes further damage, and the repair bills will be smaller. In dealing with the harvester, binder, and drill we find there are a large number of small castings and bearings to contend with, and good lubrication is again essential. In the event of a worn or broken part it is well to give the agent or manufacturer a full description, and if marked with a number this should be carefully observed. In the case of bearings, it is advisable to measure the size of the spindle which it is to fit, and so ensure getting the correct size. A machine should not be put away with a worn or damaged part. On completing work with a machine the operator is in a better position to know what parts require attention than he will be at the commencement of the following season's operations, therefore it is advisable to put a machine away in thorough working order, and so avoid overlooking any necessary repairs. The practice of manufacturers of improving their machines by the introduction of heavier spindles and otherwise strengthening them, makes it more necessary to observe any number placed on the machine for identification purposes. From this number the maker can trace the year of manufacture, and so ensure the proper duplicates being supplied. The plough and cultivator are more subject to strain than wear or breakage, and it is always advisable to have any strained parts reset to prevent further damage, and to have the soil cultivated satisfactorily. A strained plough foot or cultivator tyne will leave its mark on your work, and spoil an otherwise good job. The draft of an implement is affected by worn or loose axles, and the frame will also become strained through the same cause. Always keep the wheels running true, and axles renewed or repaired, and better work will result. Replace any lost bolts with the correct size bolt, as the frame will become strained through using too small a bolt for the hole. The whole implement may be thrown out by the use of three or four small bolts, and can only be fixed up at a large cost. In conclusion, I would repeat the main points of my remarks. They are:—Preserve your plant from the weather, keep machines on a level floor, use only good lubrication, give the agent or manufacturer every assistance in supplying details of duplicate parts, keep all bolts screwed up. In the discussion that followed, the majority of points in the paper were indorsed by members. It was generally agreed, however, that iron roofs were to be preferred to straw-covered structures. Mr. Lanyon also dealt with the question, "What is the Best Method of Harvesting Wheat?"



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BLYTH (Average annual rainfall, 16.46in.)

November 26th.—Present: 15 members and visitors.

**HINTS ON FARM BOOK-KEEPING FOR INCOME TAX RETURNS.**—The following paper was read by Mr. W. G. Sawyers:—The average man on the land is not an expert book-keeper, and even if he happened to be he would probably not be prepared at the end of his day's work to sit down and post entries into an elaborate set of books, and under those circumstances I would advocate the keeping of only two books, one of which would be a rough diary, and the other an ordinary foolscap volume ruled with a double money column on each page, or if that were unobtainable, one with a single column would suffice, and these, with the aid of cheque-book heels and the bank pass-book, should enable most farmers to keep an accurate account of their turnover for the year. My reason for advocating the use of the rough diary is that entries can be made on the actual date of a transaction, and these can be transferred to the account book later, when the farmer has time to do so. In all book-keeping it is necessary that the work shall not be allowed to accumulate, and I would suggest that the farmer transfers the particulars to the account book at least once in each month. It will be necessary to divide the account book into sections, so that the items of revenue and expenditure may be properly classified, and transferred to the taxation returns when the latter are being prepared, and I would suggest that the following headings be used on the revenue side of the book, viz.:—(1) Wheat, (2) wool, (3) grain (other than wheat), (4) chaff and hay, (5) sheep, (6) cattle, (7) other stock, (8) skins and hides, (9) milk, cream, butter, eggs, &c., (10) sundry receipts. The majority of these headings explain themselves, and in the case of "sundry receipts" any revenue not accounted for under the headings should be entered here; this list could, of course, be altered to suit individual requirements. On the expenditure side the following should suffice:—(1) Wages, (2) rent and interest, (3) seed and manures, (4) cornsacks, woolpacks, twine, &c., (5) blacksmith, (6) saddler, (7) oils, &c., (8) rates and taxes, (9) repairs (10) depreciation, (11) sundry expenses. The last item would include insurance, rail carriage, bluestone, and any other items for which headings are not specially provided. In the case of wages it is necessary to show the amount paid to each employee separately, and also to state the time for which he was employed. I would suggest that at the end of the account book several pages be set aside for the annual valuation of farm produce and stock on hand, which has to be shown in the tax return. The stock is to be valued as set out in the printed instructions received with the taxation papers, and the produce at a fair average value. In my experience the neglect of this item causes no end of trouble, more especially when the Taxation Office asks for returns to be furnished for about the past five years. It is essential in all stock transactions that a record of the numbers involved be kept, and in all other sales full particulars should be noted in the books, such as the number of bags of grain, or tons of hay, &c. One of the most important items on the revenue side of the account book is depreciation. In this connection the State allows only the cost of replacing any worn-out implement, but the Federal Department makes provision for an annual writing off. It is essential that a farmer making his return for the first time should supply the Federal Taxation Department with a list showing the valuation of the whole of his plant, and then when the returns are filled in each succeeding year he will show the original valuation, the depreciation at the rate of 10 per cent., and the valuation after deducting this depreciation. The amount of the depreciation should be totalled and carried to its proper place on the taxation return, and at the same time these particulars should be copied into the account book, or the procedure reversed, and the entries made in the account book first. This would be by far the better method, and I would certainly advocate the completion of all entries in the books before the returns are commenced. By the judicious use of the heels of cheque-books, and the careful filing of invoices, the farmer will be saved much time and trouble in keeping his books, but when several small accounts are paid by cash it is desirable that particulars should be made in the rough diary while the details are still fresh in mind, and even in the case of cheque-book heels and invoices it is desirable that entries should be posted into the account book at the first opportunity, as there is always a possibility of the invoices being mislaid or destroyed. Where a farmer's sons or daughters are employed on the farm their

wages are allowed, and will be shown under their proper heading in the account book, while the sundry entries will include the Federal allowance of £26 per annum, and the State allowance of £15 per annum for each child maintained under the age of 16 years, and also the deductions for life insurance and friendly society payments allowed by the Federal authorities, but not by the State. It is well to note that in the Federal return the employees' keep includes meat and other farm produce, which has also to be shown as "used off the farm," but in the State return the employees' keep is exclusive of these items. The noting of all the items mentioned in this paper, and the regular posting of entries into the account book should enable the farmer to arrive at a very accurate statement of his annual profit, and I think would enable him to compile his own returns, or if this was not desirable he would be able to render very valuable assistance to the agent who acts on his behalf.

**MOUNT BRYAN EAST** (Average annual rainfall, 16in.).

November 11th, 1921.—Present: five members.

**GOOD SEASONS AND THEIR DISADVANTAGES.**—The following paper was read by Mr. R. Thomas:—It is generally considered that a bountiful season through the States for feed is definite and abundant wealth for the sheepfarmer. I would like to point out some of the effects as experienced by sheepfarmers and to show some of the disadvantages that are only known to sheepfarmers and business men and firms connected with the sheepraising industry. When the whole Commonwealth has a record lambing, and sufficient feed to rear and fatten same, the supply of freezing lambs, and also for butchers' requirements, is far in excess of demand, with the result that there is very little competition, and prices fall to a low level, and sometimes, as this year, below the cost of production. Another result we are likely to experience is a big surplus of sheep as soon as the seasons become poorer. At present many owners prefer to hold their lambs rather than sell without showing a profit. This has the effect later on of forcing the breeders to sell, with practically no buyers in the market. We find in this district that a medium year suits us best, as our feed is more fattening then, and we also find that fat sheep, not being so plentiful elsewhere, there is a good demand in the fat market for our sheep. There is also likely to be trouble with grass seeds. The spear grass seeds go right through the skin of the sheep, and bury themselves in the flesh, and even internal organs, causing inflammation and much irritation to the sheep, which results in a poor-conditioned animal, and a deterioration in the value of the fleece. The wool will often peel off the sheeps' jaws and legs. Much care should be exercised at this time of the year, and every precaution taken to prevent as much as possible the seed trouble. Sometimes one may have paddocks with little or no seed, then by all means get the sheep into these paddocks. If such paddocks are not available use paddocks where sheep can get away from seeds, such as hills, scrub, &c. Shear all lambs that have not been shorn at shearing time, and trim up the faces of any that are rough. Also examine

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their eyes, and pull out the seeds at as frequent intervals as desirable or convenient. Paddocks that are fairly bare could be used with advantage, as the sheep would be better on short commons for a month or so, than amongst a lot of seeds. Any condition lost through shortage of feed the sheep will quickly regain after the seeds have gone, whereas the seedy sheep, and especially lambs, would remain poor. Also when seeds are falling one should avoid driving sheep as much as possible. An abundant season for feed and a wet summer also gives the rabbit pest an opportunity of breeding rapidly, and while there is plenty of grass for both sheep and rabbits, the increase of the pest is not particularly noticeable for a while, but if neglected will result later in a shortage of feed. One should keep a watchful eye on bunny, and keep him in his place. When rabbits are poisoned, which is the only practicable way at present, their carcasses prove to be an abundant breeding ground for blowflies. I think it advisable to bury or cover with earth any matter that breeds maggots, although admitting that this entails a good deal of work. However, dead sheep and rabbit burrows, which contain many dead rabbits, should not be considered a serious obstacle to cope with. After several good seasons in succession have been experienced, grasshoppers come in in millions, and as the outside country is earlier than this district, and the nearness of it also, results in the pest getting in here early, before our pastures are dry, resulting in great loss of feed. Mr. Thomas also read an article, "The Maggot Fly." It was decided that the Branch should go into recess until April, 1922.

#### REDHILL (Average annual rainfall, 16.79in.).

November 12th, 1921.

TOUR OF INSPECTION.—It was a happy thought which prompted Mr. M. M. Coffey to suggest that members of the Redhill Branch of the Agricultural Bureau should make a visit of inspection of the wheat crops in the district. Over 50 miles were covered, and the crops, viewed on the way, hardly without any exception, looked remarkably well. Mr. W. Stone and Mr. R. Wheaton, two life members, were among the party. Members expressed their appreciation of the kindness shown by Messrs. M. M. Coffey, F. Wheaton, and W. Stone in loaning their motor cars for the outing. A first call was made to the property of Mr. J. A. McAvaney, when a crop of Late Gluyas was inspected. A great difference was noticed between two sections of the crop, one of which had been sown on fallow, and the other on ploughed land. The latter showed a considerable growth of rubbish, and the owner expected that it would reap about six bags to the acre. This divergence in results was a strong argument in favor of sowing on fallowed land. Although it was not unusual for farmers to utilise stubble land in that way, it was the general practice to then allow the paddock to stand as fallow for a season; but, contrary to that, Mr. H. J. Crouch, who had property towards Merriton, had successfully grown wheat on the same land for five years in succession. The first year he reaped nine bags to the acre, and had never had less than four. This year the crop should yield about six bags. Mr. M. M. Coffey had also sown wheat on fallow and stubble land in the same paddock, and it was difficult to distinguish any difference in the two crops. It was probable, however, that the heads of wheat on the fallowed land would fill out better, and give a heavier yield. These instances, however, did not convince experienced farmers that, taking the average season, the labor and expense of preparing a field of fallow was not the correct and safest method of farming. Several members made reference to the splendid home recently erected by Mr. J. A. McAvaney. All appreciated the kindness of Mrs. McAvaney in providing the party with refreshments. Mr. Coffey moved a vote of thanks. The Hon. Secretary (Mr. S. A. Pengilly) then showed members his father's crop of Late Gluyas. This wheat looked well, and should give a good yield. Mr. W. Stone piloted the party round his crop, and several interesting features were noticeable. A plot which had been seeded with Currawa before the arrival of rain had developed splendid heads, but the spell of hot weather, prior to the last rain, had caused the grain to shrivel badly. However, a stretch of Federation next to it, seeded after the rain, looked much better. A distinct difference in the crop was noticed on the rising ground where the soil contained more sand, and seemed to suit the wheat plant better. Mr. Stone was disappointed with the crop near his house. He remarked that the land

had been well prepared, and was in splendid heart for seeding, but the growth was very stunted. Mr. A. A. Bentley secured his best results from the Florence variety, and he had a healthy looking plot to show members. Last season he reaped nine bags to the acre off ploughed ground with that wheat. His Major was also showing good promise, and he hoped to secure a fair yield with the new class named Minister, which he was trying. It was a club-head wheat, similar to Currawa, and the grain filled out well. Last year he gathered eight bags to the acre from a crop, the stubble of which was too thin to burn. He was confident of registering a high average if he could later secure a thicker crop. It was refreshing, after passing along a few miles of dusty roads, to see the property of Mr. H. J. Crouch, who had made his home attractive by the preparation of a well-laid-out fruit and vegetable garden. He had secured encouraging results for his trouble; the fruit trees and vegetables all showed luxuriant growth. His crop of Daphne wheat stood over 4½ ft. high, and possessed long, well-filled heads. This variety was yielding as high as 14 bags to the acre on property near by last year. Time was well spent in visiting the attractive homestead of Mr. M. M. Coffey, where the carefully attended flower garden did not fail to bring forth well-merited praise from the visitors. After refreshments had been kindly provided by Mrs. Coffey, assisted by Misses Hague and Trethourn, the owner conducted the party to his newly erected sheep dip, which was favorably criticised. Mr. Coffey was using all his endeavors to combat the menace of the blowfly to sheep, and had evidence to show of his success with a solution of arsenic sprinkled on a dead animal, and large numbers of blowflies had been destroyed. Mr. Coffey's manager, Mr. J. H. Potts, had a splendid stretch of wheat to exhibit.



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The growth was particularly even, and the heads well developed. A return in the vicinity of 30bush. would not be an unfair estimate, yet only 60lbs. of seed had been sown to the acre. Most of the surrounding farmers planted in excess of that figure. The President's (Mr. F. A. Wheaton) property was next inspected. A splendid stand of oats attracted attention, and a stretch of Currawa has developed into a crop likely to give a weighty return. On the recommendation of Mr. W. J. Spafford (Superintendent of Experimental Work for the Department of Agriculture), Mr. Wheaton had on trial a variety named "Caliph," which was showing fair promise. A splendid crop of Currawa was viewed at Mr. G. A. Button's property, and also a stretch of barley which should give a bounteous return. Mr. Button remarked that taking his crop right through it was the best he had ever grown. His newly erected home was favorably commented on by members. The day's outing was drawn to a close after a short visit to Messrs. J. J. and W. M. Hayes's crops, which, like all the others inspected, were looking well.

#### REDHILL (Average annual rainfall, 16.79in.)

October 1st.—Present: 15 members.

Under the title, "How to Make or Create More Interest in Bureau Work Generally," a paper was contributed by Mr. M. M. Coffey. Agriculturists during the past quarter of a century, he said, had profited from their association with the Agricultural Bureau. He would be a bold man who would say that the next 25 years would not show even greater advances. As a means to enable farmers to keep abreast of the times, he suggested that a scheme should be devised, whereby one-tenth of the members of any Branch might qualify for a free rail ticket, to enable them to acquaint themselves with the agricultural practices elsewhere in the State. He also suggested that the Government should commission men to give lectures and demonstrations at agricultural shows. Insofar as local Branches were concerned, visits to neighboring Branches and places of interest, and an occasional social evening, were suggested as means of increasing the usefulness of the institution.

#### WHYTE-YARCOOWIE (Average annual rainfall, 13.91in.).

November 16th.—Present: eight members.

LABOR SAVING DEVICES.—In the course of a paper on this subject the Chairman (Mr. P. McEntee) first drew a comparison between the machinery used by the pioneers and that of the present-day farmer. Continuing, the speaker said he had noticed in the Gawler district, where haygrowing was the principal occupation of the farmers, that it was customary to cultivate the fallow just after harvest in order to destroy the weeds. For that work the drill was used instead of the cultivator, and the manure was drilled in at the same time that the land was tilled. At seeding time the grain was broadcasted and harrowed in, which resulted in a considerable saving of time. To raise a dray for greasing the axle, a stick of suitable length should be placed between the shafts and the body of the dray. The shafts could then be raised until they rested on the propsticks, and both wheels would be raised from the ground at once. To remove an old strainer post, the speaker suggested the following plan:—Affix a long chain to the axle bed of the dray and hook the other end around the post. A stick, to act as a fulcrum, is then placed under the chain near the post, and the horses in the dray started forward, when the post will be pulled out. A good deal of labor could be saved by attaching the grindstone or emery wheel to the driving gear of an old winnower, the chief point being to see that the rod was shortened to prevent vibration. A considerable saving in time and labor would be effected in the stables if a loft above the mangers was erected. From the loft sloping chutes could be constructed, so that when opened the chaff would run down into the mangers. The elevator on the chaffcutter could be used for conveying the chaff into the loft. A ball top on the trough at the well would insure a constant supply for the stock, and an indicator, similar to those used on railway tanks, would show at a glance the amount of water in the tank. The paper concluded with a plea for the installation of labor-saving appliances in the home, a simple

and useful device being the provision of a servery between the kitchen and dining room, to save the women-folk from unnecessary walking between the rooms. In the discussion that followed, Mr. McGregor agreed that a good deal of time could be saved by the erection of a hay loft, but he considered that after it had been in use for awhile it collected a large amount of dust. He thought it a better plan to build the chaff shed close to the mangers, and if an opening was made from the shed into the mangers the chaff could be spread along the whole length of the stalls with a scoop. Other opinions were expressed, but it was generally agreed that on the majority of farms more attention could be given to lightening the work of the housewives.

WIRABARA (Average annual rainfall, 18.91in.).

November 5th.—Present: 22 members.

**CARE OF HORSES.**—"Good feed is one of the most important points in the proper care of the horses," said Mr. G. A. Obst, in a paper under the above title. Continuing, the speaker said if the chaff was not of the best quality the ration should be supplemented by the addition of oats or bran. Regular hours for feeding and watering between meals were also important points. If the horses did not clean up their food properly he thought it a good plan to add a little grain to the chaff, and then place a fresh supply of fodder in the stalls. Fowls were a nuisance about the stables, and measures should be taken to prevent them from polluting the food. Every horse should have its own set of harness, and particular care taken to see that the collar fitted properly. The horses should be treated kindly, commanded with a firm voice, and they would, with few exceptions, do all that was asked of them.

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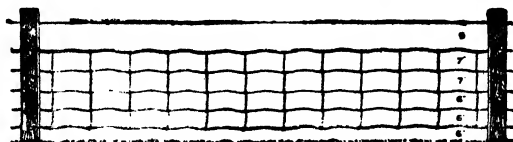


Fig. 7—Cyclone Spring Coil Sheep Fence.

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**WIREBARA (Average annual rainfall, 18.91in.).**

December 17th.—Present: 12 members.

**PETROL MOTORS.**—Mr. A. Woodlands, who read a paper on this subject, said it was advisable to dismantle the engines at least once a year, and occasionally more frequently, according to the amount of work that the engine had to perform. The main parts requiring attention were the crankshaft, bearings, connecting rod, valves, piston rings, and the ignition. If ignition was obtained by high tension very little attention should be required, other than the cleaning and adjusting of the points. As each part of the engine was taken off, it should be marked with a centre punch so that it could be returned to its proper place. For tightening the bearings he suggested the following procedure:—Secure a flat board on which is tacked a piece of coarse emery cloth. Remove the bearing cap and rub its flat side on the cloth until sufficient metal has been removed to eliminate all slackness from the bearing. Rub a little at a time, and repeat the operation until the bearing is firmly in position. If by accident the bearing was made too tight, a piece of thin paper should be inserted before finally screwing up the bolts. Great care should be exercised when removing the piston rings, as they were easily broken. The best plan to adopt when removing them was to place strips of tin about half an inch wide under them, when they could easily be slipped off. It was important to number each ring, so that each one could be replaced in its original position. The valves could be cleaned by placing grinding paste on the seat and turning it backwards and forwards with a screwdriver. To obtain the most economical running from the engine it was most important that the mixture of air and petrol should be regulated to the correct proportions. Misfiring would indicate too much air, while an excess of petrol would result in the overheating of the engine, an excessive deposit of carbon, and waste of fuel. An interesting discussion followed.

**BOOLEROO CENTRE,** November 16th, 1921.—Mr. Whibley reported that he had attended the show of farm produce held at Tarcowie under the auspices of that Branch of the Bureau, and said that great credit was due to the members for the great success of the gathering. Mr. Berry initiated a discussion on the subject, "Feeding and Management of Horses." It was resolved that the Branch should go into recess until the February meeting.

**MOUNT BRYAN,** November 12th, 1921.—Mr. A. A. Jefferies read an extract from the *Journal of Agriculture*, "How to Make Farm Life Attractive." A report of the visit of inspection paid by the members of the Branch to the Booborowie Experimental Farm was given by Mr. E. Thomas, and an interesting discussion followed.

**MOUNT BRYAN,** December 10th.—Mr. A. A. Jefferies read an extract, "Varieties of Oats," from the *Journal of Agriculture*. An interesting discussion followed, in which several members expressed their intention of experimenting with some of the new varieties mentioned in the paper.

**LOWER-NORTH DISTRICT.****(ADELAIDE TO FARRELL'S FLAT.)****LONE PINE.**

November 15th.—Present: 23 members.

**CO-OPERATION.**—In the course of a short paper dealing with this subject, Mr. A. T. Lehmann first dealt with the subject from the point of view of the employer and employee. In the first place it was necessary, he said, that there should be a clear understanding between man and master if the farm was to be run on business lines, and it was imperative that the employee should have the interest of his employer at heart. To stimulate that spirit the farmer could greatly assist by treating his men in a proper manner. The employee should, therefore, be treated as one of the family, have his meals with them, and opportunities afforded for some form of recreation. By so doing, master and man would work



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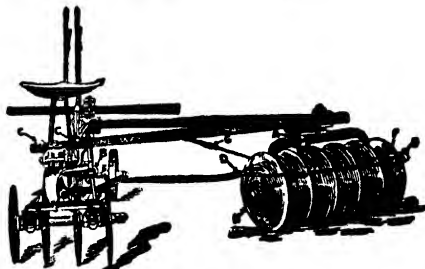
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harmoniously, and nothing but the best results would be obtained. Every person directly interested in agriculture should be a member of the Agricultural Bureau. Apart from the very useful hints that a farmer was able to give his neighbors, the members of the Branch were brought into touch with the officers of the Department of Agriculture, from whom advice on all subjects pertaining to agriculture could be secured. The speaker mentioned that in years past farmers in that district had been able to secure pure seed wheat from the Turretfield Experimental Farm, but as that was no longer possible he suggested that members should advise the secretary of the Branch of the surplus seed wheat they had on hand in order to enable members to obtain wheat pure and true to type. By sowing the best seed wheat they would be in a position to demand the top market prices; but the small producer who had to meet his liabilities was often forced to sell at a considerably lower figure than ruling prices, and thereby the price of the local market was reduced. If every farmer in the district was a member of the Agricultural Bureau a pool could be formed, into which the farmer could place his surplus hay and cereals. If that was done it should not be very difficult to secure an advance through the local bank that would enable the small farmer to meet his creditors. A Board would be elected to have charge of the pool, and the disposal of the produce would rest in its hands. Such a system of co-operation would spell prosperity for the individual and the district. A lengthy discussion followed, in which Messrs. A. Lehmann, T. Wallace, M. Ellis, F. Fromm, H. Kappler, R. Hentschke, and W. Tschirpigg took part.

#### LONE PINE.

December 13th.—Present: 21 members.

FRUIT DRYING.—Mr. H. Kappler, who read a paper on this subject, said it was very important before drying fruit to see that a sufficient number of trays were available. The fruit should not be taken off the tray until it had properly dried out, otherwise the sample would be spoiled, and result in a heavy loss to the grower. The sulphur house could be built of brick and covered with matchboard or malthoid and iron, and should be erected close to the cutting shed. If a large quantity of fruit had to be handled, he suggested the construction of a light line to carry the trucks. The drying ground, for the sake of convenience, should be close at hand, and adjoining the cutting shed. There was always a certain amount of dust and grass seeds on the drying grounds, which were hard to prevent from blowing over the fresh sulphured fruit, but if the land was sown with lucerne it would considerably lessen the danger of spoiling the fruit. The drying of cut apricots was a costly process. To secure a first-class sample the fruit should be picked when ripe, but firm. When the fruit was cut and placed on the trays, cups up, it should be sulphured as early as possible. If left unsulphured too long the sample would not be so good. The cut fruit could be sulphured in six or seven hours, using 4lbs. of sulphur to 30 trays. In fairly warm weather the fruit would dry in three to four days, but should it be very hot it was thought advisable to stack the trays, after they had been in the sun for three-quarters of a day. As regards the whole dried fruit there had been very little sale, but if growers would only dry the best sample of fruit there would certainly be a bigger demand for them. To dry apricots whole, they should be dipped in a caustic solution, and then placed on the trays. Care should be taken not to place the fruit on end, for if that was done the stone would sink to the bottom end of the fruit against the tray, which very often resulted in the breaking of the skin. Whole fruit required two sulphurings, and when it had a milky appearance it would be ready for drying. In case the sun was very hot the fruit should not be unstacked for at least two days, otherwise it was liable to scorch. Peaches required the same treatment as apricots. Prunes for drying should not be picked if they had a black appearance, for the riper the fruit the better the sample. Even if a few dropped off the trees they would not spoil if left on the ground for a day or two. It was a good plan to secure a large piece of hessian and place it under the tree; then the tree could be shaken gently, and the ripe fruit picked up. It was usual to dip prunes in a solution, using 1lb. of caustic to 10galls. of water. To have the right strength of the solution the skin should crack to allow the fruit to shrink evenly when dry. They should then be placed in boxes to sweat until they would not exude any moisture when squeezed in the hand. Before they were

boxed a second process was necessary to give them a better appearance. The second dip could be made with 1 pint of glycerine and 4lbs. of sugar to 12galls. of water. Finally, the fruit should be placed in the sun for three-quarters of a day to a day to dry.

BLACK SPRINGS, November 15th.—Mr. W. S. Kelly (Vice-Chairman of the Advisory Board) attended the meeting and delivered an address, "The Principles of Breeding."

At a further meeting held on December 13th, Mr. J. Howard read a paper from the *Journal of Agriculture*, "Weeds of the Farm," and a lengthy and profitable discussion followed.

LYNDOCH, December 15th.—Several matters, including "The Locust Plague," "Most Profitable Wheat Grown in the District," and "Take-all," were brought before the meeting, and interesting discussions followed.

WATERVALE, December 12th.—Several subjects, including "Downy Mildew," were brought before the meeting, and an interesting discussion followed.

WILLIAMSTOWN (WOMEN'S), December 7th.—Miss Laura Hammat read a short paper, "Fattening Pigs for Market." An interesting discussion followed.

WILLIAMSTOWN, January 13th.—Mr. J. B. Harris (Orchard Inspector) visited the Branch and delivered an address, "Orchard Diseases and Pests," to an attendance of 38 members and visitors.

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**YORKE PENINSULA DISTRICT.**

(TO BUTE.)

**BRENTWOOD.**

November 17th.—Present: 13 members and visitors.

**SUMMER CULTIVATION.**—Mr. F. J. Nation, who read a short paper on this subject, said as a rule the fallow should be worked back at the end of September, but a better plan was to undertake the cultivation when the weeds were green and before they commenced to seed. For the working back of the fallows he preferred the light skim plough, but if it was possible to do more than one working he thought the spring-tooth cultivator would do the better job. Very light land or sand hills should not be ploughed, but worked with the cultivator, because the ridges left by that implement prevented the soil drifting. If there were no weeds on the fallow he would not work the land when in a dry condition, as that had a tendency to allow the moisture to escape from the soil. If rain should fall during the summer months the opportunity should be taken of working the fallow with a set of harrows. After the stubble had been burnt, the land intended for cropping the next year should be cultivated at a shallow depth with a skim plough. Summer cultivation was most necessary in that district in order to deal with the "rocket weed" that infested the fallows after harvest. In the discussion that followed, Mr. C. Boundy advocated ploughing back the fallow after harvest, whether dry or wet. He had repeatedly proved that better returns resulted from that treatment of the soil. When working burnt stubble land for barley crops he had found that if ploughed too shallow the soil set too firmly for subsequent workings. Mr. F. L. Carmichael said he had worked his fallow several times with different implements last summer, and a splendid crop resulted. A cultivator, in his opinion, broke up and left the stubble land in a rough condition, and facilitated subsequent workings. Mr. J. H. Boundy concurred with a previous speaker in respect to shallow ploughing of stubble land resulting in its becoming hard. In his opinion summer working of the fallow helped to conserve the moisture in the soil.

**MOONTA.**—At a meeting held on September 24th, at which there was a good attendance, a most interesting paper, descriptive of farm life and labors, was read by Mr. W. J. Brinkworth. Although past the three score years and ten, and now retired from active farming, Mr. Brinkworth still maintains an interest in agriculture. The title he gave his paper was "How to Manage and Work the Farm when Short of Men or Cash," and he described in detail the work done, and the sequence of the different operations under the conditions mentioned.

**WESTERN DISTRICT.****CLEVE.**

November 15th, 1921.—Present: six members.

**WATER CONSERVATION.**—In the course of a paper dealing with this subject, the Rev. E. Lawson said the need and value of an assured water supply was only too evident. Australia's lack in river systems was compensated for in a measure by natural facilities for the cheap and efficient impounding of water. From gentle undulations to fine mountain ranges, ideal conditions obtained, not only for its cheap storage, but also for its reticulation and gravitation at a minimum cost. The ever-recurring setbacks could be almost, if not entirely, averted if with the aid of the engineer the gifts of Nature were harnessed. A policy of wise water conservation should commend itself to all who had the true welfare of the country at heart. Every form of production and industry was dependent to the greatest possible extent upon services that could only be rendered by water. Broken Hill and Kalgoorlie were good illustrations of its service industrially. Water supplies had also made possible sanitary improvements responsible for a very considerable reduction in the death

rate. The whole environment had undergone the most radical change. Flower, fruit, and vegetable gardens were cultivated, while parks with beautiful flowering shrubs and well-kept paths and eye-resting lawns completed a transformation as splendid as it was acceptable. The River Murray settlements were another striking illustration of the possibilities of the proper utilisation of water. A sound and intelligent scheme of water conservation was the solution of a most important problem, and it would affect for good every aspect of individual and community life.

**COORABIE** (Average annual rainfall, 11in. to 12in.).

November 12th.—Present: 10 members and four visitors.

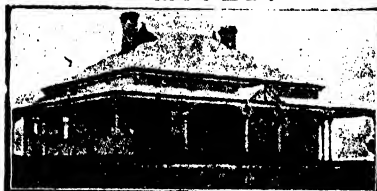
**FENCING.**—"Rabbits are among the worst enemies of the farmer, so that the farm should be fenced as soon as possible after clearing operations have been completed," said Mr. A. J. Oats in a paper on the subject, "Fencing." If the block was a new one he would endeavor to clear 200 acres the first year on the boundary, and then erect a good permanent fence. The paddocks should be made as square as possible, so that fencing operations would be simplified. On the boundary side of the paddock ti-tree posts not less than 4in. thick at the top

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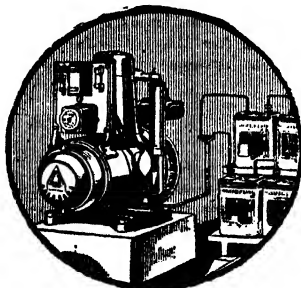
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should be erected 12ft. apart, with a strainer every 30ft. For the strainers he suggested white or "kong" mallee, 6in. thick at the smaller end, and 6ft. 6in. long. For the other fences the posts could be placed 15ft. apart, with every thirtieth post a strainer. Holes for the strainers should be not less than 2ft. 6in. deep, and the ordinary posts should be sunk to a depth of 18in. All posts should be 4ft. above the surface of the ground. In the case of a vermin-proof boundary fence he preferred 1½in.-mesh netting. The first wire should be 18in. from the ground, the second 36in., and the third 3in. from the top of the post. For the subdivision fences he suggested two No. 10 galvanized wires to carry the netting—one 36in. from the surface of the ground, and the other 3in. from the top of the post. The latter two wires could be fastened to a strainer in the boundary fence. The trench for the netting should be excavated to a depth of 6in. with a single-furrow plough. Fourteen-inch gauge wire, with barbs 3in. apart, should then be attached to the top of the fence with a piece of wire run through a hole in the posts and then twisted around either side of the wire. An excellent method of paying out the barb wire was to fasten one end of the barb to the corner post, put a crowbar through the reel, and rest it on the side rails of a cart or dray, so that the reel would revolve as the horse moved along. Barb wire did not require a very tight straining, and if possible that work should be avoided on a frosty morning, or there would be trouble with breakages. To erect the netting the roll should be run out along one side of the fence, a commencement being made at one of the corner posts. After the wire had been fastened to the post, about 100yds. should be run out, a stick threaded through the meshes near the end of the roll, and a pulley and rope attached to each end of the stick, and the netting then strained to the post. The netting should then be fastened to the wires, at least in three places between each post. Finally the trench should be filled in. If a sheep-proof fence had to be constructed, the speaker thought that it need not be so high as the other fences. There should not be less than four plain and one barb wires used, with posts 15ft. apart and 18in. in the ground, and a strainer for every thirtieth post. As regards the spacing of the wires, he suggested the following:—The first wire 7in. above the ground, the second 14in., the third 21in., the fourth 29in., and the fifth 29in. from the surface of the ground. In the discussion that followed, Mr. Underwood thought that posts in the subdivision and boundary fences should not be more than 12ft. apart. He was also of the opinion that 6in. was too deep for the trench in which to place the netting, and he considered it a mistake to strain the netting too tightly, as when that was done it was more susceptible to rust. The Hon. Secretary (Mr. H. V. Hobbs) advised erecting fences in scrub country along a cleared line, having two chains of standing timber on either side. If that was not practicable, a breakwind of scrub two chains or three chains in width should be left on the west side of all fences running in a northerly and southerly direction. Messrs Bastian and Underwood were of the opinion that while a breakwind of the width mentioned by Mr. Hobbs would have a beneficial effect on checking the drift of sand, they thought such an expanse of scrub would prove a great source of danger, in that it would provide a harbor for rabbits and vermin. They considered that a breakwind three-quarters of a chain in width would serve the purpose. Mr. Weston also read a paper, "Co-operative Insurance," and an interesting discussion followed.

At a further meeting, held on January 2nd, 1922, the Hon. Secretary (Mr. H. V. Hobbs) read an article, "Factors Which Make for Big Yields in Wheat-growing." Other matters of local interest were also brought before the meeting for discussion.

#### ROBERTS AND VERRAN.

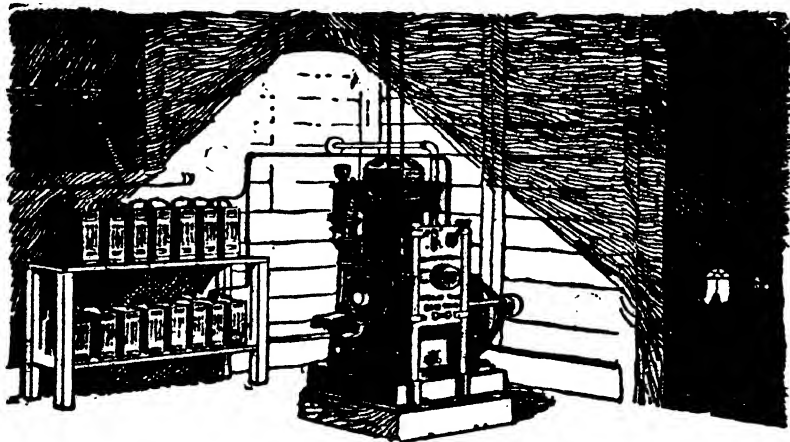
November 14th.—Present: seven members.

HARVESTER v. STRIPPER.—Mr. H. A. Simmons contributed a paper on this subject. The question that claimed the attention of almost every farmer at harvest time was "Which method is the quickest and the most economical for gathering the crop?" Too much attention, he said, could not be given to that part of the work, because much of the profit of a year's labor might be lost by the adoption of wrong methods. In that district they were familiar with two methods—the

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harvester and the stripper and winnower. Many farmers preferred the latter, because of its lighter draught, which enabled them to reap a greater number of acres a day with less horsepower. But the fact should not be overlooked that the man with the harvester could very often commence reaping an hour earlier, and sometimes work an hour later, than the man with the stripper. Some people thought that if it was the intention to clean the seed with a motor winnower it was possible to reap with the stripper if the heads would leave the straw; but he thought that, judging by last season's results, small winnowers did not prove a success as threshers. It had been repeatedly stated that the stripper was the more economical and better machine to use, because of its comparative low cost of running, compared with the harvester, but it should not be forgotten that the harvester did the work of the stripper, winnower, and very often an engine, and as it was chiefly the cost of oil and replacing of wearing parts that many had against the harvester, he thought that if they were to compare the two they would find that the harvester was the better proposition. Even when an engine was not used it was necessary to employ labor, and at the present time the cost of labor—if only for a few weeks—was much in excess of the cost of running a harvester for a season. Some people claimed that the stripper had a distinct advantage over the harvester in the saving of the wheat chaff, and whilst that had been the means of enabling many farmers to retain their holdings, even that advantage was reduced to a minimum now that chaff carriers were being used so extensively on harvesters. Very little of the chaff saved last year was of any use for feed, and hundreds of bags of wheat were destroyed through being tipped into heaps, which would have been saved if the harvester had been used. During the discussion which followed, Mr. M. Masters thought that the stripper was the more economical machine, and that by using them a superior sample of wheat would be obtained, and at the same time the seeds of foreign weeds would not be distributed over the fields, but carried to the one heap, where they could be destroyed. In his opinion a greater area could be covered with the stripper than with the harvester in the same working time. It also required very little time for oiling, whereas, on the harvester, many of the oil holes were in difficult positions, and were neglected frequently, thereby considerably reducing the life of the machine. One of the most important points in favor of the stripper was the saving of the cocky chaff. Mr. B. Evans considered that the merits of the two machines were about equal. With the harvester there was practically no limit to the width of the comb, but with the stripper the comb had to coincide with the carrying capacity of the box. The harvester was the better machine for handling heavy crops, but he preferred the stripper for light work. Much, however, depended on the circumstances in which the person was placed as to which machine would be the most profitable for him to use. Mr. Geo. Drayton preferred the harvester, and regarded it as a great time and labor saver. He thought the apparent short life of the harvester was due to negligence on the part of the operator. Mr. H. C. Videon also advocated the use of the harvester. The most favorable feature, he said, was the elimination of employing labor. It was possible for one man using a modern, wide-cut harvester to reap a large area without employing any outside labor. Unfortunately, the chaff was wasted, but with a little ingenuity a carrier could be constructed and most of the chaff saved. Mr. M. Masters then contributed a paper, "The Dairying Industry."

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YADNARIE (Average annual rainfall, 14.09in.).

November 15th, 1921.—Present: nine members.

Mr. P. G. Dolling read an article from the *Journal of Agriculture*, "Some Observations on Varieties of Oats and Their Cultivation in South Australia." An interesting discussion followed, in which several members stated that they intended securing some of the new varieties for next year's seeding. Mr. Quick mentioned that he had grown the Scotch Grey and Sunrise varieties. The horses ate the hay readily without the sheaves being chaffed. Sunrise oats, he said, were quick growers, but they did not stool very well. Mr. Dolling stated that he was growing Calcutta oats in preference to Algerian.



## YEELANNA.

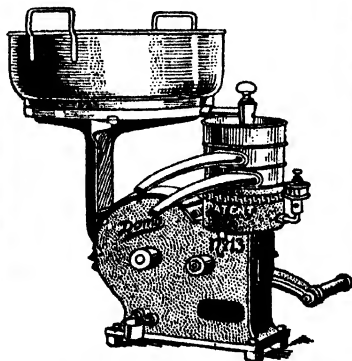
November 19th, 1921.—Present: 15 members.

**QUESTION BOX.**—The meeting took the form of a question box, when the following questions were submitted and answered:—"What is the easiest method of clearing mallee country?" Members suggested a running fire, and ploughing the land to pull out the stumps. "Is hay valuable fodder this year and what price will it reach?" It was unanimously agreed that hay was valuable property at any time, and it was thought £5 per ton would be realised for the fodder. "Are some wheats more subject to take-all than others?" It was stated that late wheats were more susceptible to the ravages of take-all than other varieties. Take-all had been noticed in Federation, while Gluyas had not been affected. "Which is the more profitable: to feed off grass stubbles or burn them?" If the land was carrying a growth of bushes it was contended that the stubble should be burnt, but if the paddocks were free from mallee shoots and other rubbish, the stock could have the benefit of the feed. "Is it advisable to follow barley with wheat?" A decided negative was given to this question, for members considered the danger of carrying the disease from one crop to the other too great to sow the two crops in succession. "What wheats are best suited to the district?" Mid-season and early varieties were favored on account of their being better able to resist take-all than the late wheats. Opinions were divided as to which was the better method of marketing wheat, the pool or open market.

**MILTALIE**, November 12th, 1921.—The Hon. Secretary (Mr. W. G. Smith) gave the final reading of his report of the Winter School for Farmers that had been held at Roseworthy Agricultural College. It was decided to go into recess until the February meeting.

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MINNIPA, November 9th, 1921.—The Manager of the Minnipa Experimental Farm (Mr. R. Hill) read a paper, "The Life of the Wheat Plant." Mr. Hill also gave a short address, "The Work of the Agricultural Bureau," and urged members to take a keener interest in the work of the Branch.

MOUNT HOPE, November 12th, 1921.—The report of the delegates to the Annual Congress (Messrs. G. A. Vigar and R. C. Myers) was received and discussed. Other matters of local interest were also brought before the meeting.

SMOKY BAY, November 12th, 1921.—A lengthy and interesting discussion took place on the recent outbreak of "Swine Fever" in the locality. On advice received from the Stock and Brands Department farmers were urged to isolate for six weeks any animals that showed symptoms of the disease. A discussion also took place on the fertiliser deposits on Yorke Peninsula.

SMOKY BAY, December 12th.—The Hon. Secretary (Mr. G. O. Lovelock) read an article from the *Journal of Agriculture*. Several items of local interest were also brought before the meeting and discussed.

WUDINNA, November 5th, 1921.—The chairman (Mr. H. P. Cabot) read an article from the *Journal of Agriculture*, "Farm Sanitation," and a lengthy discussion followed. The report of the delegates to the gathering was also received and discussed.

## EASTERN DISTRICT.

### (EAST OF MOUNT LOFTY RANGES).

COONALPYN (Annual average rainfall, 17.49in.).

November 15th.—Present: six members and two visitors.

OVERSTOCKING.—The Hon. Secretary (Mr. F. Tregenza), who contributed a paper on this subject, said the stock on the farm could not be kept in a healthy, thriving condition if proper provision was not made for an abundant supply of fodder throughout the whole of the year. During the first year's occupancy of a scrub farm, considerable forethought was necessary to avoid the overstocking of the holding. As clearing operations extended, and the holding was subdivided into smaller paddocks, conservation of hay could be adopted, and the settler would be quite safe in increasing the numbers in his flocks and herds. He was convinced that it was essential for the farmers to give more consideration to the policy of erecting stacks of hay and straw to tide the stock over lean seasons should they occur. The carrying capacity of the property could only be safely gauged by the condition of the natural pasture during the autumn and winter months of the year, unless, of course, fodder was held in readiness for handfeeding the stock when the pastures were bare. The most economical plan to adopt was to keep the stock in prime condition if it could possibly be done, for a poor beast appeared to be always eating and always hungry. He thought that the majority of young stock in South Australia did not receive sufficient food during the early days of their lives. It might be that the farmer was ignorant of the requirements of the animals, but he was of the opinion that it was more often a case of neglect to supplement the grazing in the cold and dry months of the year. In the mallee areas they needed the maximum number of stock on their properties; but that could not be successfully carried out unless the holdings were subdivided into small paddocks, and proper arrangements made for the conservation of fodder and water.

DESTRUCTION OF VERMIN.—In a paper dealing with this subject, Mr. J. J. Angel expressed the opinion that rabbits could best be kept in check by trapping once or twice during the year. Kangaroos were also responsible for a good deal of damage to the wheat crops; but he thought a couple of good dogs would keep the animals away from the farm. If the foxes worried the poultry he suggested tying up the dogs in different positions close to the fowlhouse, and baits distributed in the dry season close to a water supply. He had caught foxes and wild dogs by placing a piece of meat close to a yacka bush and setting the traps on either side of the bait. Shooting, he considered, to be the only successful method of dealing with bird pests.

**COLT BREAKING.**—At a further meeting, held on December 14th, Mr. J. J. Cronin contributed a paper on this subject. The speaker was of the opinion that the colt was best broken in by handling the foal a week or so after it had been born. He spoke very strongly against the practice of breaking in the animals by "fear and violence," and believed that very much better results would be obtained by adopting correct methods of restraint, patience, and kindness. One of the first and most important points to give consideration to was to secure proper control over the head of the animal. After that had been obtained, and the animal's natural fear dispelled to some extent, a move could be made to rub over the other parts of the body with the hands or a stick. He preferred the use of a leather halter, as that reduced the danger of injuring the colt to a minimum. The main point was to endeavor to gain the confidence of the animal, and to let him know that he would not be hurt. All that then remained to do was to work the animals in the team, between some old and tried horses.

**FRUITGROWING FOR THE DISTRICT.**—At a further meeting held on December 14th, a short paper on this subject was contributed by Mr. F. Pitman, in which he said, before any attempt was made at planting the trees, it was most important that every stump should be taken out of the piece of land selected for the orchard. At least two years should elapse after the land had been cleared before an orchard was laid out, owing to the very sour nature of the soil in their district. In the training of the trees, an endeavor should be made to avoid long stems, on account of the very strong winds that prevailed, and it would be a wise provision to plant a breakwind around the western and southern sides of the orchard. The trees to form a breakwind should be planted at least 40ft. away from the main garden, and the block securely fenced to keep out stock and vermin. If proper pruning methods were adopted, and the land kept thoroughly cultivated, he believed the growing of fruit on the farm could be made a successful venture.

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## GLOSSOP.

November 8th, 1921.—Present: 17 members and three visitors.

A summer pruning demonstration was given on Mr. J. J. Robertson's property by the Manager of the Berri Experimental Orchard (Mr. C. G. Savage).

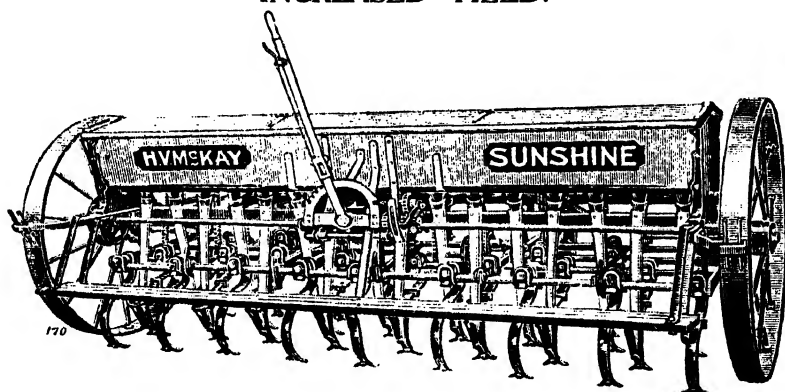
**FRUIT GROWING.**—The meeting was continued in the evening, when the following paper was read by Mr. Savage:—*The Apricot.*—The apricot is one of the most popular dried fruits, but it is the most difficult to handle should the weather turn in damp and sultry during harvesting operations. Under such weather conditions the fruit ripens rapidly and falls to the ground, and much fruit is lost unless the grower has a fair staff to handle the crop. In the past most of the apricots were split and then dried, but of recent years the whole-drying of the fruit has come to the fore. Though the whole-dried fruit is a better and more palatable article, yet at times the sale of the fruit is slow. The reason of this is not hard to find, for the trouble rests with the grower himself. In the first instance many of the smaller fruits are dried whole because they are costly to split, with the result that a dried article is produced which is little else but skin and stone, and does not commend itself to the public. In the second instance, carelessness in sulphuring and drying is responsible for a dark, unattractive article being placed on the market. The whole-drying of apricots is a far cheaper method of handling the crop than by splitting the fruit, but only the best of the fruit should be dried whole, and one must aim at producing a bright, attractive, clean article. Apricots should be thoroughly ripe, but not squashy, when picked for drying. In whole-drying, the fruit may be dipped first in a boiling lye, made by adding 1lb. caustic soda to 30galls. of water. The fruit is then placed upon the trays, care being taken to see that the fruit is placed on its side. Should a fruit be placed on either the apex or base, the finished product is an irregular shape, with the stone usually protruding through the skin. The rupturing of the skin during the drying process allows the juice to escape, carrying with it much sugar, thus the weight of dried fruit is reduced as well as the flavor being affected. The fruit also sticks to the tray, making the removal of it difficult. When the trays are filled with fruit they are then placed in the sulphur house, and subjected to the fumes of sulphur for six or seven hours. From the sulphur house they are placed out on the drying green. Should the weather prove very hot, the fruit should be stack dried for a couple of days before exposure to the direct rays of the sun. When the fruit is nearly dry the trays are again stacked, and when the fruit is still pliable, but free from juice, it is placed in the sweat boxes. After sweating for several days it is ready for grading and packing. Many growers do not use the lye dip, but place the fruit directly on to the trays from the picking tins, and from thence into the sulphur house. The object of dipping the fruit is to slightly crack the skin; this facilitates drying operations, and appears to aid in the bleaching action of the sulphur fumes, thus obtaining a bright colored product. To dry split apricots the fruit is cut in halves around the sutural margin, care being taken to see that the apricot is cut around the whole circumference and not torn apart. Fruit that is torn and not cut presents a ragged appearance, and the uneven edges allow juice to escape when the fruit is sulphured. After removing the pits the apricots are placed on the trays with the cups uppermost. They are then placed in the sulphur house, and sulphured until the cups are nearly full of juice. This process takes from four to six hours, according to the weather. On bright days the sulphuring is done in less time than is the case when the weather is cool and the sky cloudy. From the sulphur house the trays are spread on the green and are opened to the sun for two days to four days, according to the temperature. The trays are stacked, and drying completed in the stack. This gives the grower more liberty in picking the fruit off the trays before it becomes over dried than is the case where the fruit is wholly dried in the sun. The fruit is sweated for a few days to allow the moisture contents to even up, and is then ready to grade and pack. *The Peach and Nectarine.*—The nectarine requires similar treatment to that of the apricot; it is dried both as whole and split fruit. The peach is dried as split fruit; the operations are practically identical with those described for the drying of apricots, with the exception of the length of time that the fruit is in the sulphur fumes. The sulphuring of peaches takes from six hours to eight hours. *The Pear.*—The pear is picked when fully matured, though green. The

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stem breaks away freely from the twig when the fruit is given an upward lift when the pear is ready to gather. The seeds of the fruit will also be found to be dark colored when the pear is matured. The fruit should be gathered very carefully in order that it is not bruised. It is placed in boxes to yellow up and ripen. This process is hastened if the fruit is packed away from the light. When the pears are nicely colored and are soft to the touch they are ready for drying. The fruit is cut in halves and placed on the trays with the cut side up, and then subjected to sulphur fumes for several hours. The length of time the fruit is left in the sulphur house often extends 10 hours to 14 hours. Care must be exercised in seeing that the whole of the fruit is spongy before taking it out of the sulphur house. Should any hard patches be felt in the fruit these are usually found where the fruit is resting on the trays. Close the house again and resulphur, for if the fruit is dried in this condition a poor dark-colored article will be produced. Many growers shade dry their fruit. I think this a mistake, as a canary-yellow product is the result. The fruit should be given a couple of days' sun, and the drying completed in the stack. By this method a bright golden dried pear is produced. I believe when this product becomes more widely known a good market will be opened for it, but growers must do their best to produce a good, clean, and high quality article to gain the confidence of the consumer. *The Fig.*—The fig should be thoroughly ripe when gathered, and in the case of the Smyrna should have commenced to wilt. The fruit is gathered into dip tins, immersed for half a minute to three-quarters of a minute into a boiling brine (3ozs. salt to each gallon of water) to fine down and slightly crack the skin. The figs are then placed on the trays, care being taken to see that the large figs have the eye uppermost to prevent the loss of juice through the opening. If the figs are of the Smyrna variety they are placed direct on the drying green and exposed to the sun. Should they be White Adriatic they are sulphured for about 10 minutes to 15 minutes to fix the color before placing on the drying green. In a couple of days the fruit is turned to facilitate the drying process and to prevent the larger figs moulding on the under side. In five days to seven days the fruit will be ready to sweat. The sweating process takes about a couple of weeks, during which time the fruit is stirred up every three days or four days. The figs are now graded, washed in a cold brine to remove any dust or grit that may have adhered to them during drying operations, and redried for half a day, to evaporate the added moisture. Just prior to packing they are often placed in a steam bath for about 15 minutes. This process tends to soften the skin, and aids in destroying insect eggs that may have been deposited on the fruit. The figs are packed in  $\frac{1}{2}$ lb., 1lb., 7lb., and 28lb. packages, care being taken to place the eye end towards the inside of the package and the stem end out. The eye end has the toughest skin, and by keeping it towards the centre of the package it does not dry out so readily. *The Prune.*—To produce the highest quality dried prune the fruits must be thoroughly ripe before gathering. Many growers do not pick the fruit from the tree, but allow it to fall to the ground before gathering. The prunes are placed into dipping tins, and immersed in a boiling caustic dip (made by adding 1lb. caustic soda to each 20galls. or 30galls. of water). This process slightly cracks the skin and allows the moisture to evaporate readily. Do not over crack the fruit, as the skin is liable to fold back, exposing the flesh, and when dried a very inferior article is produced. Should the weather prove very hot, shade drying is recommended, otherwise the skin of the fruit will become very tough. Drying may be completed in the sun. When dealing with light-colored plums, such as the Coe's Golden Drop, the fruit is heavily sulphured after it has passed through the dip in order to fix the color. The fruit is placed into sweat boxes when the excess of moisture has been evaporated. The sweating process extends about a week or 10 days, during which period the fruit should be occasionally mixed so that there will be a uniform degree of moisture throughout the fruit. The prunes are then graded, and in many cases are placed in a steam bath for 15 minutes to 20 minutes. This process has a double purpose, the principal one being to soften and fine down the skin and to improve the texture of the flesh. Secondly, it also aids in destroying insect eggs that may have been laid on the fruit during drying operations. The final process consists in glossing the fruit, in order to make it more attractive. Several glossing dips are used, but the

majority of them have glycerine as a basis. One made on the following recipe will be found to give good results:—1lb. glycerine, ½lb. salt, ½lb. wattle gum, 20galls. water. The dip should be boiling, and the fruit immersed for several seconds. The prunes are then placed on the drying trays for two hours to four hours according to the weather, and are then ready for packing. *The Currant.*—The fruit should be thoroughly ripe when gathered, the sugar contents should be high, and the skin dark black in color. Currants gathered when the skin is red give only a second-grade fruit. The density of the must should be about 13deg. Baume when picking commences. The fruit is placed directly on to the racks, it not being necessary to dip it, owing to the fineness of the skin, which readily allows the evaporation of the moisture. The trade demands a black currant, and to obtain the best results the fruit is shade dried; that is, the racks are covered so that the direct rays of the sun are cut off. Currants dried exposed to the sun are usually more or less red in color. The fruit usually takes upwards of three weeks to dry. So soon as the berries may be rubbed off the racks without bursting they are placed on hessians and spread out to the sun to finish off the drying process. The fruit is then sweated for a week or so, stemmed, and packed. *The Sultana.*—The sultana berries are gathered when the sugar content has reached about 12deg. to 13deg. Baume. The fruit is passed through a boiling lye before placing it upon the racks or trays. The lye varies in strength according to the condition of the fruit. The object of the dipping is to slightly crack the skin to allow a quick evaporation of the moisture. The fruit should be tested by immersing a bunch in the boiling lye, and, if after being exposed to the air for a minute or so, minute cracks appear around the stem end of the berries, the lye may be considered to be the right strength. Should the fruit be cracked severely the lye needs to be diluted, whereas, if no cracks are noticeable, more caustic soda will be necessary. The lye will vary from 1lb. of caustic soda to 20galls. to 40galls. of water. Unlike the currant, a light golden fruit

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is required, so that the berries are exposed to the sun after being dipped, in order to produce the golden fruit. In five days to seven days the berries will be ready to place on the hessians and then into the sweets. *The Lexia*.—The lexias, or pudding raisins, are made from the Muscat Gordo Blanco fruit and the Waltham Cross (popularly known in these areas as White Malaga). The fruit when gathered is dipped in lye, made by adding 1lb. caustic soda to every 8galls. to 15galls. of water. The cracking is done a little more severely than in the case of sultana fruit, but care must be exercised to prevent the fruit being too severely split. Like sultanas, these fruits are opened to the sun throughout the drying operations, and, like other grape fruits, are usually finished off on hessian sheets before sweating. *The London Layers*.—The London layers or clusters are usually made from the Gordo and Waltham Cross grapes. The fruit is sun dried, and is not placed through any dipping solution, but placed straight on to the trays. The bunches are handled by the stem in order to prevent the brushing off of the bloom from the fruit. The damaged berries should be removed from the bunches before placing them on the trays. After the fruit has been drying for a week to 10 days it is turned, each bunch being lifted separately by the stem, the underside berries being placed uppermost. When dried the fruit is packed into 1lb. and 7lb. packages. *Treatment of Fruit During Wet Weather*.—All fruit should be protected from rain where it is being dried on trays. The trays should be stacked in stacks of 10 to 12, and covered so that the rain cannot reach the fruit. Where possible the racks should be covered permanently with iron, and when wet weather sets in it is only necessary to run on the side curtains. Most racks are not covered with iron, and it is essential that good top hessian or canvas coverings be held in readiness to run over the racks, and the side curtains should be so made that they can be easily and quickly fastened in position. Should sultry, moist weather continue, and the fruit become slightly moulded, it can be cleansed after it has dried by passing it through a boiling solution of caustic soda (1:30), then through a cleansing bath of cold water to remove the soda. The water in the cleansing bath should be constantly changed, otherwise its object is defeated. The fruit is then redried, sweated, graded, and packed. Towards the end of the season the nights become cold and dewy, and under such conditions the fruit, if on trays, should be stacked at night. If on sheets, the sheets should be rolled each evening and opened out next morning to the sun. If this practice is not followed the fruit reabsorbs moisture during the night, and the drying process is prolonged.

#### ROSY PINE.

November 25th, 1921.—Present: eight members.

**MANAGEMENT OF SHEEP.**—"I am convinced that a farmer in this district who has 800 acres and upwards of land cannot work his property to the best advantage without sheep," said Mr. Wilson, in a paper on the above subject. Continuing, the speaker said the sheep were a great help in keeping the fallow free from weeds, and the farmer was not wholly dependent on the wheat crop for his income. One of the most serious and common mistakes made in handling the flock was in overstocking the property. Too many farmers were inclined to say, "the sheep can look after themselves." That was a fallacy. They required just the same care and attention as other forms of livestock. Particularly would the sheep relish a frequent change of pasture, even though the feed might not be so good in the fresh paddock. During the summer months the sheep would do considerably better if the water supply was close to the pasture. It was to be regretted that too many farmers neglected sheep suffering with wool blindness and the tailing of the lambs. It was not an uncommon sight to see sheep with the wool growing practically right over their eyes, and lambs of all sizes and ages in the flock. Such things could easily be remedied by giving a little time and attention to the flock. As regards the best sheep for the district he was strongly in favor of the large-framed Merino ewes, crossed with a ram of a suitable breed. For a number of years he had obtained good returns from the flock by raising fat lambs for the export market. He had first used South Down rams, but as the lambs were inclined to be a little on the small side they soon dropped out of favor with the exporters. His experience with the Dorset Horns was that while that cross with the Merino ewe threw a fine compact lamb, the ewes were only able to lamb



with considerable difficulty. Lincoln rams were then tried, and the lambs by that cross were fine and robust animals when the mothers had plenty of milk, but so soon as the feed commenced to dry off they seemed to lose condition more quickly than the black-faced breeds. The chief objection to the Shropshire-Merino cross was the difficulty that the ewes experienced in lambing. It was said that nearly all the mutton breeds of sheep were bad fencers, but if proper care was taken of the fences the trouble would be reduced to a minimum. Many farmers kept to the pure-bred Merinos, because they secured a larger percentage of lambs and cut the best fleece, but when £1 a head at five months old could be obtained for crossbred lambs he failed to see how a farmer could excel that with the Merino. The average farmer could not compete with the large stations in the raising of ewes for breeding purposes, so that he thought it the best plan to purchase full-grown breeders. The farmer who had hoggets had to provide feed for them throughout the whole of the year, but the flockmaster who sold his lambs at the end of each year only had his breeding ewes to provide for during March, April, and May, that period of the year when fodder was so often scarce. Later on in the season, when grass was more abundant, his flock would be at its best stage. An interesting discussion followed.

#### WINKIE.

November 15th, 1921.—Present: 24 members and two visitors.

**SUMMER PRUNING.**—The Manager of the Berri Experimental Orchard (Mr. C. G. Savage) visited the Branch and read the following paper:—The term ‘Summer Pruning’ is somewhat broad, as it covers the whole of the pruning applied to trees and vines throughout the growing period. I propose to deal with the subject in two sections—(a) Framing the young plant, and (b) pruning to assist rank-growing plants to produce well-ripened fruiting wood. (a) *Framing the Young Plant.*—Perhaps the greatest benefit obtained from summer pruning is in the framing of the young tree and vine in the early years of the plantations. By judicious thinning out and cutting back of shoots, a year or more may be gained in the framing of the plants. *The Vine.*—Let us first pay attention to the framing of the young vine. When this is planted in the winter it is usual to cut it back to one spur carrying two buds. During the first year the main object should be to encourage the young vine to develop a good root system, and to do this the top leaf growth should be encouraged, for the greater the amount of leaf surface the greater the amount of elaborated plant food. The roots are nourished by the food manufactured in the leaves, and conveyed back to them through the tissues of the plant, and not by the crude plant sap gathered directly from the soil. The practice adopted in some vineyards of cutting back the vines in their first year to one shoot has little to commend it. I prefer to leave the whole of the growth upon the vine, and to put the time that would be spent in disbudding into keeping the surface soil well worked around the vines to conserve the soil moisture. The vines, in the usual course, would in most cases during the second winter be cut back to a single two-bud spur, but under exceptional conditions, where a strong, well-developed shoot is found, the vine may be taken to the first wire. Assuming the vine has been reduced to the two-bud spur, there will arise two shoots from these buds, and probably several base buds will also burst into growth. In the early spring the whole of the small shoots, with the exception of the two, may, and should be, rubbed off. The two remaining shoots should be encouraged to grow up—one only is required to frame the vine—but the two are left until the shoots have passed what is known as the ‘brittle stage,’ and the tissues have started to toughen. Should one shoot be broken off through the wind or other causes, the second can be used to form the stem of the vine. whereas, if only the one had been retained and then lost, difficulty may arise in getting a new growth to burst out, and time is lost in framing the vine. When the shoots are passed the brittle stage, and the danger of their being broken off by the wind is lessened, the second shoot is cut away. The remaining shoot is trained up to the wire on which the vine, in the case of the trellised vines, is to be framed, and when it has grown a few inches beyond it, the shoot is cut back to the wire and securely tied, the object being to force into growth the top buds, the growth of which is trained along the wires. These secondary growths in the winter will be utilised to form the first portion of the main arms. This

practice is followed where espalier vines are to be formed. Where cordon vines are to be framed, the one growth is encouraged to grow on, and in the winter it is bent and laid down on the wire. In the case of the gooseberry bush vine, stakes should be driven down beside the vine, and the growth cut back to within 1ft. to 15in. of the soil to force out the lateral shoots. When the vines have been headed back, more lateral shoots will arise from the buds placed along the stem than will be required, so that the superfluous shoots should be cut back. Some growers even cut off the leaves arising around the main shoot below the wires. This is a very unwise procedure, as it not only allows the direct rays of the hot summer sun to strike upon the tender bark of the shoot, but it also reduces to an unnecessary extent the food factories. This practice, if followed out, will tend rather to reduce the vitality of the plants than to be advantageous, as the bark is liable to be burnt and hardened by the hot sun, thus reducing the ready transmission of sap, and also reducing the supply of elaborated plant food. Should wire be unobtainable, and the trellis through other causes is not erected during the second winter, the vines should be staked, if time permits, and the summer growth headed back to the height at which the wire will eventually be placed. Where the growth has been strong enough to reach the wire in the first season, and has been cut back at the wire on which the vine will be framed, one of the new shoots which have been retained for the arms may grow stronger than the other, it will therefore be necessary to nip back the point of the stronger shoot in order to give it a temporary check, and to allow the weaker shoot to catch up in growth. The weaker shoot may also be tied in position with the growing end pointing up, while the stronger one is tied in a horizontal position. This method will encourage the sap flow in the one, and retard it in the other. Coming to the third summer, the pruning will be reduced to disbudding the water shoots that arise along the stems of the vine. *Fruit Trees.*—Most of the fruit trees when planted out are headed back to within 12in. to 18in. of the surface of the soil. The resulting growths may, after the brittle stage has passed, be reduced back to the required number of shoots necessary to frame the arms. Shoots will also be found growing from the stem. In many instances these should be reduced back, and an advantage is gained if the two or three leaves towards the base are retained. These leaves will tend to shade the stem from the sun. This is especially important in the case of citrus trees. Where the stems of citrus trees are exposed, a loose covering of straw tied around them will be found to give good results, and will prevent the hardening of the bark. During the first season the treatment of the leaders consists mainly of pinching out the growing points of the strong shoots to give them a temporary check, while the weaker ones are left untopped. Under exceptional circumstances, and where the trees are making very rapid growth, the leaders may be cut back during the early summer to the position where it is advisable to subdivide them, and

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**Arthur H. HASELL, PORT ADELAIDE,**  
MANUFACTURER and IMPORTER.

the resulting shoots used as leaders during the following winter's pruning operations. The thinning out of citrus trees during the first two or three years, if followed out, should only be very light, the object being to produce a well-grown tree, the foliage of which completely shades the limbs and stems. In the second summer the wood shoots should be reduced to the number required for framing the tree, and if advisable to subdivide these shoots again, they may be cut back to the point of subdivision in the early summer, say during November. Should the centres of the trees be dense, the inside growths should be thinned out, care being taken to see that the remaining foliage shades the limbs. If some of the shoots that are left are rank in growth, they may be reduced back to within a few inches of their base. This will cause the remaining buds to shoot and grow into fruit-bearing wood for the following season. The thinning out of the shoots will allow the free entrance of light and circulation of air, thus ensuring the ripening of the inside fruit wood. *Treatment of Grown Vines and Trees.*—*Vines.*—The summer treatment of vines is confined to the removal of water shoots on the stems of the vines and the removal of suckers arising from the roots, topping being resorted to under special circumstances. The indiscriminate topping often seen in many vineyards has little to commend it, the main object being the removal of top growth to allow of easy cultural operations, but better results would be obtained from the vines, especially where the growth is not exceptionally strong, by rolling the foliage around the wires of the trellis. The topping back of very vigorous sultana vines which make exceptionally strong canes with long intervals, may sometimes be found advantageous if done in early summer. The cutting back of the shoots produces secondary canes from the remaining buds, which are usually short jointed. By this method more buds are obtained per foot of rod than would have been the case had the vines not been topped. Thus the crop prospects are usually brighter, as more fruit-bearing growths arise from these secondary shoots. Dense currant vines, especially those on the ends of the rows which receive excess water, will not carry the dark-colored fruit towards the centre of the vine unless the foliage is cut back to allow the light to penetrate to the centre of the vines as the fruit is ripening. The severe topping of vines can be carried to excess, and cases are not unknown in these areas where the vitality of the vine has been impaired by too severe topping done too often and too late in the season. *Deciduous Trees.*—The summer pruning is usually applied to deciduous trees in the early years, when the trees are young and vigorous, and when they are apt to make excessive wood growth to the detriment of the successful maturing of the fruit wood and buds. The practice of pruning should be to give what is known as a spring pruning, that is, as soon as the fruit has developed the stone, and the new growth is about 18in. long. This condition of the trees will be found to have been reached in these Murray areas about November. The leaders, where too dense, should be thinned out, and, if necessary, they may be cut back in order to subdivide them. Shoots that have been left, but failed to set fruit, may be reduced to within a couple of buds of their base. This will cause fruit shoots to develop from the remaining buds. Where the lateral growth is too strong both on the outside and inside of the tree, it should be judiciously thinned, and the remaining shoots which are very strong may be cut back to within 4in. or 5in. of their base to force the remaining buds into growth, which will, in most cases, develop into well-developed fruit wood by the end of the growing season. The object of all summer pruning on framing trees is primarily to convert the surplus wood growths into fruit wood, so that one must study the time in ones particular district which will give this result. Early pruning may cause the resulting growths to develop too strongly, and a second pruning would be found necessary to gain the desired end. Late summer pruning may not give the results one desires; that is, the breaking into small fruit growths of the buds left on the reduced wood shoots. If the work is carried out during November, December, and the first fortnight of January in these areas, the results obtained should prove satisfactory. Possibly some of the new shoots from the trees pruned in early November may grow strongly, and a further light thinning out could then be done with advantage. The question often arises, especially with the apricot, "What should be done with the rank wood shoots found in the centre of the tree? The proper season of the year to treat these shoots is in the summer, and the shortening of them to within 6in. or

so of their base is usually followed with the satisfactory development of wood twigs and shoots. If these shoots are left, and shortened back in the winter, the result is usually not the development of fruit shoots, but of three or more strong wood shoots arising in the centre of the tree. Summer pruning is not followed to the same degree as the trees increase in age and commence to settle into regular fruiting, and lose their excessive vigor. The thinning of the crops may also be termed a form of summer pruning, and is often found necessary where the tree has set a very heavy crop. The thinning should be followed out just before the stone is commencing to harden, when the reduction of the number of fruits will be more than compensated by the extra size and quality of the remaining fruit.

#### WINKIE.

December 19th.

**IRRIGATION AND SEEPAGE.**—The following paper was read by Mr. A. Setterberg:—Irrigation, as we know, is absolutely necessary in the whole of the Murray Valley for proper growth and ability to bear crops on the part of both trees and vines. I am opposed to the excessively heavy waterings that are popular with a lot of growers. Firstly, because this country being adapted (as it is) to arid conditions, the subsoil is unfortunately absolutely unsuitable to drain away vast quantities of water, which, in the majority of cases, sooner or later, bring seepage. Secondly, it is unnecessary. Our sandy soil, being adapted to dry conditions, naturally retains moisture much more than heavy soils. It is surprising how small an amount of water is necessary, with proper cultivation, to keep vines and trees in good heart. This applies particularly to young vines and trees of 12 to 18 months old. Seepage is one of the greatest menaces that growers have to face. But I think it is possible to delay the evil hour by taking proper precautions and irrigating moderately. We have a patch of pears, about three acres, on the lower portion of our block. We have only irrigated them on the average twice a year, and that with only one furrow. I am certain that if we had watered them as heavily as other portions of our block seepage would have developed. Rows should not, in sandy soil, be more than five chains long, and the fall about 4in. to 6in. to the chain. The method we adopt in irrigating at the beginning of the season for trees in full bearing is to allow about 10 hours to each furrow. The reason for this is that during the early part of the season the weather is considerably cooler, and there is not much loss of moisture through evaporation. Secondly, trees and vines at that period have very little foliage, and consequently do not need the same quantity of moisture as when in full foliage and maturing their fruit. Later on, in the hotter months, we water more heavily—from about 12 to 15 hours to the furrow. For young blocks, as in New Winkie, I would suggest early in the season about eight hours to the furrow, and during the hotter months 10 to 12 hours to the furrow. This applies especially to furrows that have not too much fall. Get the water across the row as quickly as possible, and then ease the pipes until the stream is regulated so that it will run down the furrow with very little tailing. We must remember that we are irrigating our vines or trees, and not the headlands. That is where fairly level watering is an advantage, as it eliminates washouts on headlands. My advice to all growers is to water moderately, and to bear in mind that cultivation is almost if not quite as important as water. Also, every blocker should know just what depth of soil there is on his land, and, knowing this, he must use his own judgment to a great extent. He must also bear in mind that it will be a sorry day for him if he ever gets seepage, as it is a costly job to drain, and if the land is not drained on the first sign of seepage he will, without a doubt, lose his vines or trees planted on the affected area.

**BARMERA, December 13th, 1921.**—Mr. H. S. Taylor, of the Renmark Branch, attended the meeting and delivered an address, "Marketing of Dried Fruit." Mr. Taylor also dealt with the subject, "Cotton Growing in the Murray Valley."

**BERRI, November 16th, 1921.**—An interesting and instructive paper, "Soils and Their Treatment" was read by Mr. H. Levien, of the Renmark Branch. Mr. D. Jones, a visitor from Queensland, was also present, and addressed the members on the subject, "The Cultivation of Cotton in the Murray Valley."

BERRI, December 12th, 1921.—The Manager of the Government Experimental Orchard (Mr. C. G. Savage) read a paper, "Fig Culture," and replied to numerous questions relating to the subject.

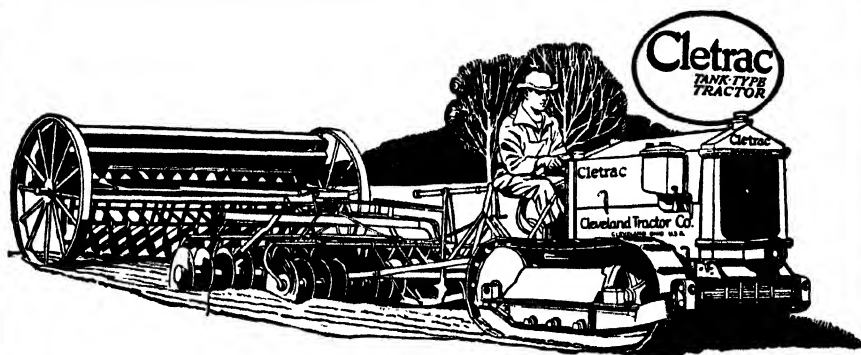
BERRI, January 9th.—A well-attended meeting was held on the above date, when Mr. W. Jarrod delivered an interesting and instructive address, "Methods of Drying and Packing Sultanas and Currants."

LONE GUM, November 9th, 1921.—Mr. W. E. Muspratt (Irrigation Instructor and Inspector) visited the Branch and delivered a lecture, "Seepage and Underground Drainage."

LONE GUM, October 12th.—Mr. A. G. Alexander, of the Renmark Branch, attended the meeting, and contributed a paper, "Planting and Care of Young Sultanas." A paper on the subject, "Training and Care of Young Vines," was also contributed by Mr. H. Berriman.

The following programme of meetings has been received from the Hon. Secretary (Mr. W. P. Henwood):—March 15th—Paper, "Green Manuring," Mr. Halliday; April 15th—Paper, "Vegetable Growing," Mr. W. R. Lewis; May 10th—Paper, "Pruning," Mr. L. Chapple; June 7th—Addresses, "Cotton, from a River Point of View," Messrs. Savage and Muspratt.

MONARTO SOUTH.—The following programme of meetings has been received from the Hon. Secretary (Mr. C. F. Altmann):—March 11th—Paper, "Fencing," Mr. H. Rayson; April 8th—Paper, "Lime-burning," Mr. C. Harper; May 6th—Paper, Mr. J. Hartmann; June 10th—Paper, "How to Keep a Farmyard," Mr. W. Liebelt; July 8th—Paper, "Tank-building," Mr. C. F. Altmann.



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**MONARTO SOUTH, January 14th.**—The meeting was devoted to a discussion on the past harvest. Members tabled samples of wheat. It was ascertained that the average weight per bushel was 62½lbs.

**MYPOLONGA, November 16th, 1921.**—Mr. L. Rankine (Inspector of the Stock and Brands Department) attended the meeting and delivered an address, "Parturition in Cows."

**NETHERTON, November 11th, 1921.**—An interesting discussion arose out of the decision of the Branch to secure new varieties of oats from the Roseworthy Agricultural College. Other matters of local importance were also brought before the meeting. It was decided to go into recess for the month of January.

**RAMCO.**—The following programme of meetings for the year ending July 3rd has been received from the Hon. Secretary (Mr. J. J. Odgers):—February 6th—Papers, Messrs. P. Milne and W. Robertson. March 15th—"Packing and Grading," Messrs. H. Green and A. E. Brown. April 10th—Papers, Messrs. E. Borrowings and J. Irrgang. May 8th—"Packing Oranges," Mr. F. Lewis. June 5th—Paper, Mr. F. G. Rogers. July 3rd—Annual meeting.

**RAMCO, November 14th.**—Mr. R. Stanley contributed a paper, "Building Haystacks." The question, "What is the correct time of the year to apply artificial manures?" was brought forward, and was responsible for an interesting discussion.

**WILKAWATT, November 19th, 1921.**—A large number of members attended the meeting to hear an address by Mr. A. J. A. Koch, of the Lameroo Branch, on the benefits derived from the Winter School for Farmers that had been held during the past year at the Roseworthy Agricultural College. It was decided that the branch should go into recess for the harvesting months, the work for the new year being commenced at the March meeting.

**WILKAWATT, December 17th.**—A special meeting of the above Branch was held, when consideration was given to a number of subjects, the chief point being the request of the Advisory Board to supply them with information concerning the most popular varieties of wheat grown in the Wilkawatt district.

## **SOUTH AND HILLS DISTRICT.**

### **BALHANNAH.**

**December 16th.**—Present: 17 members.

**DAIRY FARMING.**—In the course of a paper on this subject the Hon. Secretary (Mr. H. A. Spoehr) said he intended to deal with the question as applying to conditions in the Onkaparinga Valley, which district he considered to be one of the finest dairying centres in the State. The winter, in most of the hills districts, was very severe, and he had found it necessary to house the cows during the cold months of the year. The majority of the dairy farms in their district contained, as a rule, from 80 acres up to 200 acres, and he suggested the subdivision of the holding into paddocks of about 10 acres each, so that the stock would be afforded a frequent change of pasture. In addition to that, the above plan kept the grass sweet, and one was able to carry considerably more head of cattle. After a number of years' experience, he had come to the conclusion that the milking Shorthorn was the best breed of cattle for the hills. In addition to being hardy and heavy milk producers, the calves and aged animals could be fattened and bring a good price in the market. For winter feeding, provision should be made for a supply of hay, which, when chaffed and mixed with bran, made a splendid ration. Of the summer fodders, Sudan grass and Japanese millet had proved themselves excellent crops, because several cuts could be taken during the one season. The cowshed, for the dairy farms in the hills, should open to the east, as very little rough weather was received from that quarter. Whatever method was adopted in milking—machines or hand labor—regular hours should be strictly observed. The animals should at all times be treated with kindness and patience. When the cow had calved the calf should be taken from its mother as soon as possible. The heifer should be handled very carefully when

being first brought into the yard, and every effort made to teach the animal to stand without leg-roping. The milk from the freshly calved cow should not be used for human consumption until after the first four days. Cleanliness was most essential in the handling of all dairy products, and it was imperative that the hands, milk utensils, and the udders of the cows should be thoroughly clean. The profitable cows in the herd could be ascertained by weighing each cow's milk over a given period. A little bonemeal in the feed once a week would prevent stiffness in the joints, and as the district was very deficient in salt it was a good plan to see that the animals had access to a salt lick. During the hot days in summer, many dairy farmers had trouble in keeping the milk sweet, but that difficulty could be practically overcome if a large 40gall. cask was obtained and cut in halves. These should be filled with cold water, and the milkeans stood in them. When the cans were taken to the factory in the summer they should be covered over with wet bags, over which dry bags should be placed. If that was done, the milk would reach the factory in good condition, even on the hottest days. After separating, the machine should be taken to pieces and thoroughly cleaned. If handling cream, every possible care should be given to the product. Warm and cold cream should not be mixed together. The cans should be washed out at home as well as at the factory. The lids should not be placed on the milk or cream can when at home, but a piece of muslin kept to cover each tin. To dry off the cows the speaker suggested to miss one milking a week for the first week, and then only milk every third milking. Some cows would milk right up to the time of calving, but he considered it advisable to give the animals a spell of about six weeks, to give them a chance to recuperate. An interesting discussion followed. Mr. A. Schriever tabled a sheaf of Phalaris. He explained the methods of growing the crop, and distributed a quantity of seed among the members.

CHERRY GARDENS (Average annual rainfall, 35.03in.).

November 15th, 1921.—Present: 10 members.

The subject for the evening was a discussion on the topic, "The Best Method of Preserving Apples for Home Use." Mr. Lewis considered that to secure the best results the fruit should be carefully picked, wrapped in greaseproof paper, packed in an ordinary fruit case, and then stored in a room of even temperature. He was of the opinion, however, that it was not advisable to store any great quantity, as there was too much danger of the fruit deteriorating. Other members agreed with the views expressed by Mr. Lewis.

CHERRY GARDENS (Average annual rainfall, 35.03in.).

December 13th.

The annual social of the above Branch was held on December 13th, 1921, when 12 members and 70 visitors attended. The Chairman of the Advisory Board (Mr. C. J. Tuckwell) and the Secretary (Mr. H. J. Finnis) attended, and delivered short addresses, and the Clarendon, Longwood, and Blackwood Branches were represented. Musical and elocutionary items were also given.

GUMERACHA (Average annual rainfall, 33.30in.).

December 19th.—Present: eight members.

SUMMER CULTIVATION.—"This subject is one of vital interest to every farmer in this district, because we depend to a very large extent on the crops that can be raised during the summer months of the year," said the Hon. Secretary (Mr. G. R. Randell), in a paper under the above heading. Continuing, the writer said that, so far as his experience went, the most important part of the work to be performed was that carried out during the late autumn and early spring. For summer crops such as potatoes, mangolds, tomatoes, onions, &c., it was imperative that the soil should be in excellent condition. When it was possible, the flats which were to be used for the summer crops should be broken up to a depth of at least from 8in. to 10in. during June or July. Such land, after the first working, should be left in a rough condition, as that gave the sunlight and air an opportunity of sweetening the soil. By September or October the flats should be ready for the second working, which should be done with the plough, working across the

original furrows. If the second cultivation did not make the land thoroughly clean, it should be scarified and rolled several times before planting operations were commenced. In the case of the potato crop, he suggested harrowing and rolling the land after planting was completed. It was also a good plan to run a set of light harrows over the potato plot when the plants were sufficiently high above the ground to enable one to detect the rows.

#### LONGWOOD (Annual average rainfall, 37in. to 38in.).

November 12th, 1921.—Present five members and five visitors.

**HOMESTEAD MEETING.**—The monthly meeting of the Branch was held at Mr. J. Risley's homestead. Mr. Risley works his property as a mixed farming proposition, and combines pig raising, fodder growing, and sheep with the cultivation of fruit, flowers, and vegetables. A bed of Jerusalem artichokes, used for pig feed, attracted considerable attention. Mr. Risley stated that he had found a mixture of red oil, fat, and kerosine a good remedy for keeping hares from damaging the stems of apple trees. Afternoon tea was provided by Mrs. Risley, after which a short reference was made to the recent Conference of Hills Branches. Other matters of local interest were also brought before the meeting.

#### MOUNT PLEASANT (Average annual rainfall, 26.87in.).

November 11th.—Present: four members and visitors.

**FARM WORKSHOPS.**—The chairman (Mr. D. C. Maxwell), who contributed a paper on this subject, said a valuable saving of time and money could be effected on every farm if the necessary equipment and tools were provided for blacksmithing, carpentering, and boot repairing. The speaker then mentioned a list of the tools necessary for the work, and stated that with such a set of tools, &c., he was able to keep down the working expenses of the farm. Particularly was that so in regard to the blacksmith's shop, for nearly every farmer was able to do such simple jobs as welding links, making eyebolts and S hooks, and shoeing the horses. As regards the shoeing, he believed he saved 50 per cent. of the cost charged by the local blacksmith. He had been able to do that by purchasing reject shoes from the Military Department and doing his own shoeing. Charcoal made on the property was used for the work in the smithy. He was in favor of the erection of the shop on the farm, but he was convinced that it was a mistake to use it for other than minor jobs. Any large and complicated repairs should be taken to a skilled tradesman.

#### PORT ELLIOT (Average annual rainfall, 20.33in.).

November 19th.—Present: eight members.

The monthly meeting of the Branch was held at Mr. W. Hargreaves' residence, when interesting discussions took place on the subjects "Take-all" and "Summer Fodders." The Chairman (Mr. H. Welch) reported that caterpillars were doing extensive damage to the pea crops in the district. In the course of the discussion that took place on "Summer Fodders," the ravages of the lucerne flea was mentioned.

#### ROCKWOOD.

November 15th.—Present: 17 members.

**CO-OPERATION.**—Mr. S. Collett delivered a short address on this subject. The speaker instanced the success that had attended the venture of co-operative concerns in South Australia and other States of the Commonwealth. In the discussion that followed, Mr. A. Carter said it was essential that farmers should co-operate, but it was a very difficult problem to induce every producer to trade through the same firm. Mr. E. R. Heath was in accord with the principle, and thought co-operation should be adopted by the farmers to help one another during the busy seasons of the year. Messrs. Dunn, Steed, Meyer, and Deiner also spoke.

#### ROCKWOOD.

December 12th.—Present: 21 members and one visitor.

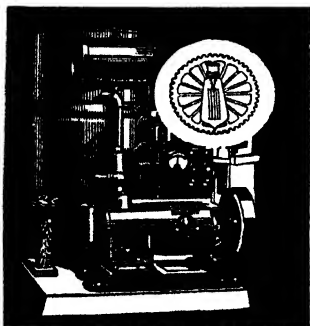
**BLACKSMITH SHOP ON THE FARM.**—Mr. M. J. Meyer read a paper on this subject. "No farm," he said, "should be without a blacksmith's shop and a good set of necessary tools. During the winter months one could always find little



jobs to do in the shop, such as making eyebolts, split links, &c., which were continually being required on the farm. Valuable time could also be saved during harvesting operations by repairing small breakages in the shop. In selecting a site for the smithy, plenty of space should be allowed for implements, &c., to be taken alongside. The structure should be built of stone to minimise the danger from fire. The forge should be built in the centre of the shop, so that one could work at it from all sides. Where bellows were used, it was necessary to build a good fireplace, about 18in. above the floor, because it was inconvenient to have the forge too high if heavy work had to be performed. Portable forges were in general use in the country, and were very serviceable for farm work. A good kit of tools and a vice were necessary, also a few pairs of tongs for flat or round iron, a 2lb. engineer's hammer, a drilling machine, and various punches. The last mentioned could be made from old rasps or other pieces of good steel. Extra tools would mean that more work could be done, and with greater satisfaction. Shoeing required a little study of the anatomy of the hoof of the horse, coupled with good sound practical judgment. In preparing the hoof, care should be taken not to pare off too much horn, or in leaving too much on, because either might cause injury to the hoof. Care should be taken to ensure that the hoof was pared down level, and the shoe made to fit the hoof, not the hoof to fit the shoe. He did not advise burning the hoof too much with the hot shoe, but just sufficient to cause the shoe to rest evenly on the hoof. When nailing on the shoe it was not advisable to drive the nails so that they just entered the side of the hoof, because the nail would have to go too far into the hoof to hold. If the correct sized nails were used, eight, set in so as to come out about 1½ in. to 1½ in. above the shoe, would result in a wider clinch, and hold the shoe more firmly, and they would not be likely to cause any injury to the horn. In referring to the work of welding, the speaker believed a good clean fire and clean iron to be of primary importance. When the pieces for welding were sufficiently heated they should be given a sharp square knock on the anvil, to remove all particles of dirt. When a blue liquid appeared to be running over the iron in the fire, he usually regarded that as a sign that the metal was ready to be withdrawn for welding. An interesting discussion ensued, in which Messrs. Heath, Rogers, Henley, Nash, Smith, and Dunn took part, when all agreed that a blacksmith's shop was a most necessary adjunct to the equipment of the farm."

ASHBOURNE, November 21st, 1921.—Mr. A. H. Codrington (Wool Instructor at the School of Mines) attended the meeting and delivered a lecture, "Wool-classing for the Farmer."

ASHBOURNE, December 19th.—On the occasion of the final gathering for the year, the meeting took the form of a social entertainment, when a number of the members contributed vocal and elocutionary items. Refreshments were provided, and a most enjoyable time was spent.



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BALHANNAH, January 6th.—Mr. E. Leishman (Orchard Inspector) attended the meeting, and delivered an address, "Fungus Diseases and Insect Pests."

BLACKHEATH, November 14th, 1921.—A paper under the heading, "A Few Points for the Producer," was contributed by Mr. E. H. Pym, and an interesting discussion followed.

BLACKHEATH, December 9th.—A short paper, "Practice What You Preach," was contributed by Mr. L. W. Talbot, and a short discussion followed. Other matters of local interest were brought before the meeting for consideration.

PORT ELLIOT, December 17th.—Several subjects of local importance were brought before the members, and an interesting discussion followed. The chairman (Mr. H. Welch) reported the failure of portion of his crop through take-all. Mr. H. Smith also stated that caterpillars were doing a considerable amount of damage to the oat and pea crops.

### SOUTH-EAST DISTRICT.

MOUNT GAMBIER (Average annual rainfall, 32in.).

November 12th, 1921.

BUSH FIRES.—The following paper was read by Mr. R. F. White:—In the first place firebreaks must be ploughed on the most dangerous sides, or where we think a fire will come from. A clearance should also be made around all strainers, corner posts, and gate posts, as they are the mainstay of the fences. The best break is formed by ploughing four or six furrows about a chain apart and burning the strip in between. Even if no burning is done the plough strips will be a great help to the men when the fire comes that way. It is a good plan to plough a few acres around the water troughs and burn them off, for the area so treated will serve as a place to drive the stock on when in danger. The stock are generally round the water on a hot day, and it is always in the hottest weather that fires occur. It is also advisable to have a few furrows ploughed on the boundaries, for one never knows which way the wind will turn. I have seen a fire stopped on a sheep track with plenty of willing workers, some lighting and others beating and burning against the wind until the fire was headed. I think it is the duty of every landholder, at the first sign of smoke in the district, to go and ascertain where the outbreak is. Some people lock their gates in the summer time. This is a mistake, as it prevents anyone getting in to save the stock. I think each district should club together and secure a force pump, hose, and a good tank on a spring van or small wagon, so that it can be sent out quickly. Four men or five men with a good plant would do more towards stopping a fire than 20 men or 30 men with beaters. Moreover, a fire plant is a fine thing with which to put out posts, logs, trees, and stumps after the fire has been beaten. A tree can be put out 20ft. above the ground; so it will be seen that such an equipment would save a lot of work. On the first night of a fire the watchers should not leave the spot until they know that there are enough men left to go right around and put out the logs, trees, and stumps, and throw in all the sticks. One cannot be too careful on the first night. Then someone must be at work again at daylight next morning to look for dangerous places. If the weather continues hot, it is a good thing for several men to watch the scene of the outbreak, and ride around it for two days or three days. It is a wise precaution to burn off any rough scrub early in the year, as fires nearly always come in from the scrub. Control officers are all right in their own districts, but it is a mistake for one to take charge if he does not know the country he is in. A control officer should know all the tracks and roads in his district, for he will then have some idea where to try and stop the lead of a fire. If it beats him in one direction he should know where the next best place is to try again. He should tell off two or three reliable men to ride around the fire and let him know if there are any dangerous places, for he cannot possibly be everywhere himself. When you go to a fire there is always some way in which you can help, even if it is only to get something for the men to drink from the nearest houses. The leather beaters are very useful, but I prefer a

green bough when it can be obtained, for it is much better for sweeping. In conclusion, allow me to reiterate—Get to the fire as quickly as you can—that is the main thing—and work when you get there. A fire can be stopped much quicker provided it is tackled before it gets a spread on. The Secretary said he had seen Mr. White at fires, and he was convinced he knew what he was talking about. He was one of the best fighters in their part of the district. He knew that last year he spent nearly all Christmas Day and night at a fire. He had given the Bureau some very practical ideas, which, if given out to the public, should prove very helpful. He congratulated Mr. White on his paper, and moved a vote of thanks to him. Mr. Sassanowsky, in discussing the paper, said, unfortunately, it was always left to one or two to do the work at a fire, whilst others looked on. The need, however, was to make arrangements whereby a fire could be met and defeated before it assumed such proportions as required so many men to fight it. They in the Gambier West district had a water cart, and if the others in the various districts were to club together and procure water carts they would be found to be most helpful. A force pump as well as the tank and ordinary pump was also a necessity. After a fire the posts usually smouldered, and a pump coming behind could do a great deal to make things safe. The trouble, however, was that the farmers did not look after their own properties by providing fire-breaks. If they did that it would be of great assistance to the fighters. The farmers were far too careless in protecting themselves against fires. He doubted if in the whole district they would find 5 per cent. of the farmers trying to safeguard their properties by breaks. He also thought certain roads near the scrub should be cleared and ploughed up. He recognised that they had to be careful of sand-drifts, but such precautions were necessary. The most important thing about fires was to prevent them. The president (Mr. W. Manser) thought Mr. Sassanowsky would be safe if he said not 1 per cent. of the farmers ploughed breaks against fires.

#### NARACOORTE (Average annual rainfall, 22.60in.).

November 12.—Present: 11 members.

**AUTUMN v. SPRING LAMBS.**—Mr. W. E. Rogers read the following paper:—This question is open to much controversy, and sound arguments may be brought forward on both sides. There is amongst sheepbreeders a great diversity of opinion, as so much depends upon individual effort and local conditions in each particular district. Local conditions on the average are as follows:—(a) Comparatively cool climate with a rainfall of about 3in. from January to April; 12in. from May to August; and 6in. from September to December. (b) The soil varies in character from heavy dark loam to that of a light sandy nature. (c) The natural grasses are of fairly coarse and strong growth, but unfortunately do not possess the fattening properties contained in the grasses of the warmer climate of the north, and in the fertile districts around Mount Gambier and parts of the eastern States. (d) The country around Naracoorte (exclusive of a limited area of higher and more productive soils) in its natural state is only suitable for raising stores, unless fodder crops are supplemented during the winter months. (e) The feed is usually plentiful from October to February; fair during March, April, and September, but, without early winter rains, decidedly short from May to August. (f) There is an unlimited supply of water a few feet below the surface in the western part of the district, also at a greater depth in the eastern portion. The above conditions, coupled with the purpose for which lambs are required, forms the foundation upon which any opinions should be based. The south coast of Australia is essentially a fine-wool producing country, and this industry seems to absorb the attention of the principal sheep-breeders, who generally concentrate their efforts on the Merino type of sheep, or some slight degree removed. This particular breed of sheep is not favored for freezing purposes, as they are, as a rule, poor mothers, slow to mature, of unshapely small frame, and lightly covered with flesh. Most of us in our endeavor to make profitable use of our country, anticipate good seasons, and fall into the error of overstocking; but I feel satisfied that if we were to carry only two-thirds of the number of sheep our profits would not be less at the end of the year. One of the most important steps towards this end, and which I am afraid most of us brush lightly aside, is to get rid of the rabbits,

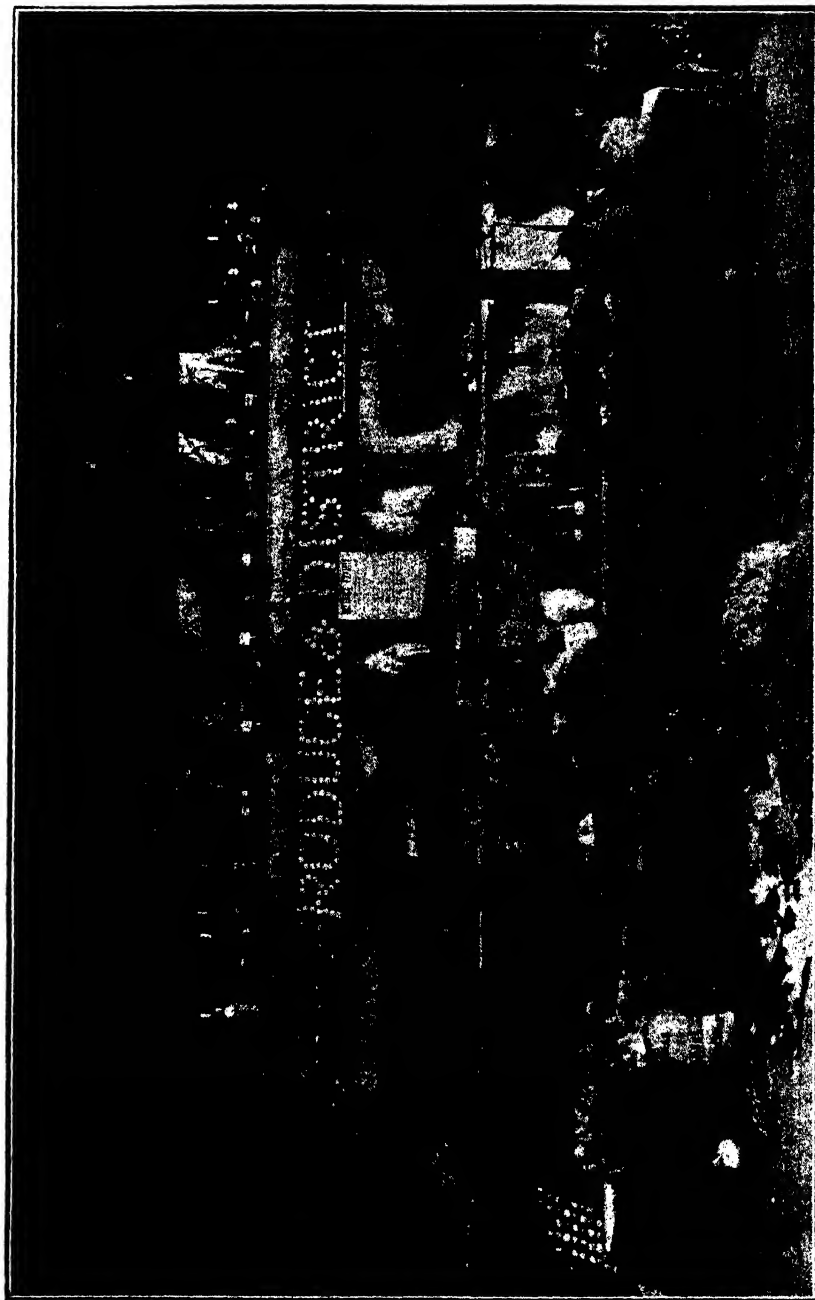


Exhibit Staged by the Naracoorte Branch of the Agricultural Bureau at the Recent Show Held Under the Auspices of the Naracoorte Pastoral and Agricultural Society.

which undoubtedly deprive the sheep of the more nourishing and succulent grasses, and open the road to undermining their constitution. The best time for lambing seems to me to a very large extent interwoven with the nature of the farming operations carried out on each separate holding, and also its possibilities. The success or otherwise of autumn lambs—preferably lambing in May—greatly depends upon early winter rains, and, failing this, whether they could be economically kept in uniformly rising condition without a setback during the cold months by reserving grass land or growing crops for their sustenance, such as Cape oats, rye, or Cape barley sown about the end of April. These lambs are easily handled in October for shearing, when they would be from five to six months old, and, if well kept during raising, should cut about 5lbs. of wool, and weigh upwards of 30lbs. dressed weight. Mother and progeny would be readily saleable as stores, or possibly fats, in a favorable time of the year, and I think the tendency to the matting of the wool in the mother would be less. Most of us do a little cropping, and provision for topping up in February and early sale as forward stores, or possibly fats, could have been made previously on the farm by sowing a small area in peas alongside the crop and utilising it in connection with the stubble. Lambs raised at this time of the year are more difficult to handle during shearing, and give you little return for wool, and, I think, more subject to collection of grass seeds and ravages of the fly. Viewing the question from different standpoints, I am inclined to the opinion that autumn lambs are most profitable, providing a good supply of food could be economically maintained during the winter months, but as very few are in a position to do this the safer course to follow is to divide responsibility by breeding about one-third of the year's requirements in the autumn and the balance in the spring. In the discussion that followed, Mr. J. J. Donoghue favored the autumn lamb. The spring lambs had some good feed at the beginning, but afterwards they were on short commons at a time when they wanted filling out. The autumn lamb was on short commons for a while, but it had the benefit of the spring feed later on, when it was most required, and at shearing time it returned a great deal more wool than the spring lamb. The spring lamb was knocked about a good deal while it was very young, and that was against it. They could grow green stuff for the autumn lambs and ewes. There was nothing like a bit of green feed for stock when the grass had dried. Mr. G. Turnbull thought in the cross with Dorset Horns it would not do to start with maiden ewes. Mr. W. S. Rogers exhibited a sample of linseed, grown by Mr. Donoghue.

The following programme of meetings for the year ending July 8th, 1922, has been received from the Hon. Secretary (Mr. Geo. Turnbull):—March 12th—Paper, "Mixed or Combined Farming," Mr. C. Bray; April 9th—Paper, "Beautifying the Homestead," Mr. A. B. Feuerheerdt; May 13th—Paper, "Advantages of Boys and Girls' Agricultural Clubs in Canada;" June 10th—"Fowls Likely to Prove Most Profitable to the Average Farmer," Mr. F. A. Holmes; July 5th—Annual meeting.

PENOLA (Average annual rainfall, 26.78in.).

December 3rd.—Present: 10 members.

**HAYMAKING.**—Mr. Adamson, who contributed a paper on this subject, expressed the opinion that, although in a season such as they had just experienced the harvesting of grass hay could be profitably undertaken, he believed that for general purposes of fodder conservation, cereals, such as oats and wheats, would be found the better proposition for the farmer. He had tried Gluyas Early, Yandilla King, Queen Fan, and Baroota Wonder, all of which were first-class hay wheats, but he favored Gluyas Early, as it was very sweet and nutritious if cut when on the green side. Baroota Wonder was also very palatable to the stock, and yielded a large tonnage per acre. King's Early was another good variety, but the beard made it somewhat objectionable from a feeding standpoint. From his experiences, he believed that the Algerian was the best oat for their district. The general tendency of the majority of farmers in the South-East was to allow the crop to become too ripe before cutting. It was most important from a fodder conservation aspect that the hay should be cut before it became too dry. The ideal stage at which to cut the wheat crop for hay was just after the flowers had fallen and the grain contained a certain amount of milk. He was also of the

opinion that Algerian oats could be cut in a much greener stage than was the general farming practice. If that were done, the stock—particularly dairy cattle—would relish the hay. When cutting the crop, the sheaves should be made into large stooks immediately after the binder. The advantage of the large stook was that if the hay had to remain in the paddock for a considerable length of time the evaporation would not be so great as in the case of the small stook. In the discussion that followed, Mr. Marcus thought that when the hay was cut on the "green side" there was very little corn in it, and therefore, it was not very nutritious. Mr. Yeates favored cutting the crop when the grain was in the doughy stage. For wheaten hay he favored White Tuscan and Frampton's. Mr. Rickett thought the best hay crop was one obtained from a mixture of oats and wheat.

#### RENDELSHAM.

November 9th, 1921.—Present: 17 members.

Mr. V. Smith read an instructive paper, "The Swamp Grass *Poa aquatica*," in which he stated that the grass would grow on any swamp land. He exhibited a sample taken from a swamp hole on burnt-out peat lands. The clump shown was strong and of a healthy color. The grass itself had many advantages, the chief being that it could easily be eradicated should it spread to any extent. It was an evergreen, and that fact should encourage landholders to give it a trial. A very fine exhibit of grasses was shown by Mr. R. Foster, the chief varieties being rye grass, barley grass, canary grass, white and black prairie, Californian lucerne, and Yorkshire fog. The rye grass grew particularly well in their district. In reply to a question from Mr. S. Smith regarding the methods of harvesting, Mr. H. A. Stewart said that stripping for large crops and flail threshing for small quantities were considered the best ways of harvesting rye grass.

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## TANTANOOLA.

October 15th, 1921.—Present: seven members.

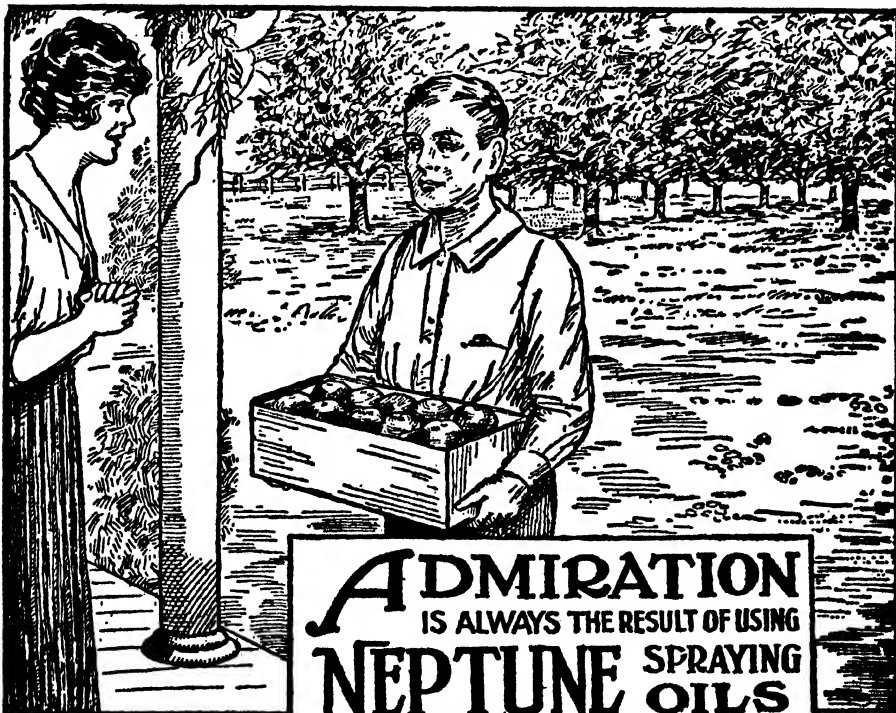
**FARM MANAGEMENT.**—In the course of a paper under the heading, "Farming Suitable for the District," Mr. C. Kiely said, owing to the increased value of land, and the high price of machinery, it was necessary for the farmer to improve the standard of his livestock by using pure-bred sires, to increase the carrying capacity of his pastures, and to adopt sound methods of cultivation of the soil. There was no doubt that, under favorable conditions, the land in the South-East was capable of great production, but one of the main obstacles to success was the provision that had to be made in the way of drains to carry off the surplus water. Many farmers were in the habit of ploughing around the paddocks. That he considered a mistake, especially when the land was wet or the water was unable to get away. The better plan was to plough the paddock in "lands," and if the soil sloped to one side of the paddock the water would be carried off in the furrows. With a V-shaped sledge, made by splitting a fair-sized strainer post in two, the loose dirt could be pushed out of the furrows in a very short time. With a sledge and a disc plough, quite a number of small drains could be made in one day. To secure the best results, the sledge should be pulled at an angle, so that one side would run along the bottom of the furrow, while the other pushed the dirt out by going up one side and down the other. If the operation was performed a second time a drain 5ft. wide and 18in. deep would be excavated. The higher bars could then be completed with a pick and shovel. The effectiveness of the sledge would be considerably improved if a flat piece of iron projecting a few inches below the wood, was bolted on to the side of the implement that pushed the dirt out of the drain. If the sledge was inclined to ride over the dirt it could be weighted down with stones or some other heavy material. Work of that nature could only be successfully performed when the land was dry. Ploughing should be commenced as soon after harvest as possible, and the land worked down to a fine tilth with the cultivator. A good burn was very necessary for the success of crops grown on stubble land. The seed for sowing should be thoroughly cleaned before drilling, and he considered it false economy to apply light dressings of manure to the land. The speaker then referred to the importance of keeping the horses in good condition and providing them with plenty of good feed and a place to roll after they had been unharnessed. The high cost of the machines and implements warranted the erection of a weather-proof shed for housing accommodation. The belts of the machines should be given an occasional dressing with neatsfoot oil. If any of the bearings were inclined to run hot, he suggested mixing blacklead with the oil, as it had a soothing effect on the metal. When the binder had finished work for the season the knotter should be coated with grease to prevent it from rusting while in the shed for the rest of the year. A good discussion followed.

**LUCINDALE, December 17th.**—The Hon. Secretary (Mr. P. Dow) initiated a discussion on the subject "The Blowfly Pest." The speaker mentioned the results of his experiences in dealing with the flies. Mr. Secker had successfully used a mixture of Stockholm tar and kerosine. Mr. Copping stated that when the flies were very bad he had been able to check their attacks on the sheep by catching the ewes and swabbing them with Cooper's dip. A splendid sample of wattle bark 3in. in thickness was exhibited.

**MOORAK, December 15th.**—Mr. E. S. Alcock (Field Officer for the South-Eastern districts) contributed a paper, and an interesting discussion followed.

**TATIARA, December 17th.**—An interesting discussion on the subject "Power Driven Machinery" took place. It was decided to place on record the valuable services that had been rendered to the Branch and the district by the late Hon. Secretary (Mr. Thos. Stanton). The meeting adjourned for five minutes as a mark of respect to the deceased member.

**WIRREGA, December 17th.**—Mr. H. Exton tabled an excellent sample of Japanese millet, and gave his experiences of the crop as a summer fodder for dairy cattle. Other matters of local interest were brought before the meeting for discussion.



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**All communications to be addressed:**

**"The Editor, Journal of Agriculture, Victoria Square, Adelaide."**

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T. PASCOE,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### Conference of Agricultural Bureau.

Branches of the Agricultural Bureau situated in the Mid-Northern district are to meet in Conference at Crystal Brook on Wednesday, March 8th. The Conference will extend over three sessions, and the gathering will be addressed by the Minister of Agriculture (Hon. T. Pascoe, M.L.C.), the Director of Agriculture (Professor A. J. Perkins), Mr. W. S. Kelly, in addition to other officers of the Department.

### Bulls for Hire.

The Department of Agriculture has two Shorthorn bulls which are at present available for hire by Branches of the Agricultural Bureau, other similar bodies, or individual farmers. The conditions governing the leasing of these animals can be obtained on application.

## IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC.

During the month of January, 1922, 11,861bush. of bananas, 4bush. of grapes, 1bush. of mangoes, 74bush. of passion fruit, 3 packages of peanuts, 795bush. of pineapples, 6,671 bags of potatoes, 17 packages of bulbs, 20 packages of plants, 37 packages of seeds, and 2,417 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910. Of these, 20 empty wine casks were fumigated, and 119bush. of bananas and 6bush. of pineapples (over-ripe), 1bush. of mangoes (no fruit fly certificate), and 4bush. of grapes (prohibited entry) were destroyed.

Under the Federal Commerce Act, 1,503 packages of dried fruit and 185 packages of fruit pulp were exported to oversea markets. These were consigned as follows:—To London—1,278 packages of dried fruit, 185 packages of fruit pulp. To New Zealand—225 packages of dried fruit.

Under the Federal Quarantine Act, 2,588 packages of seeds, &c., were examined and admitted from oversea sources.

### *Interstate Imports.—Examined at Mount Gambier, January, 1922.*

	Packages.	Bushels.
Apples . . . . .	16	16
Apricots . . . . .	11	11
Bananas . . . . .	86	129
Lemons . . . . .	6	6
Oranges . . . . .	5	5
Peaches . . . . .	3	3
Peanuts . . . . .	3	—
Pineapples . . . . .	7	11
Plums . . . . .	10	10
Tomatoes . . . . .	2	2

Of these 8bush. of citrus fruit were fumigated, and 1bush. of plums and 5 second-hand cases were destroyed.

## DEPARTMENTAL DOINGS.

### GENERAL.

During February the Minister of Agriculture (Hon. T. Pascoe, M.L.C.), accompanied by the Director of Agriculture (Professor A. J. Perkins) and the Superintendent of Experimental Work (Mr. W. J. Spafford) visited the Government Experimental Farm at Kybybolite.

The Secretary Advisory Board (Mr. H. J. Finnis) visited and addressed meetings at Second Valley, at which centre a Branch of the Bureau was established, and Whyte-Yarcowie. In addition, he attended a meeting of representatives of River Murray Branches at Barmera for the purpose of discussing pruning competitions for the coming year.

Mr. F. C. Richards visited Meribah and addressed a meeting of the local Branch of the Agricultural Bureau.

### HORTICULTURE, ETC.

Mr. C. H. Beaumont, Orchard Instructor for the Southern District, addressed a meeting of the Mount Barker Branch of the Bureau on "Preparation of Land for Horticultural Purposes" on February 8th.

### FARM BUILDINGS, ETC.

On February 7th the Field Engineer (Mr. J. Paull) visited Mr. B. Klan, of Auburn, and gave advice on matters pertaining to irrigation. Mr. C. Basham was visited on February 27th, in connection with the construction of stables, barn, and general farm buildings.

### POULTRY, ETC.

The Poultry Expert (Mr. D. F. Laurie) addressed meetings of the Agricultural Bureau at Balhannah and Crystal Brook. On February 23rd a number of poultry farmers in the vicinity of Scott's Creek were visited.

### ORNITHOLOGY.

Capt. S. A. White, C.M.B.O.U. (member of the Advisory Board of Agriculture) has during the month delivered illustrated lantern lectures on the economic aspects of bird life at Two Wells, Gawler River, and Point Sturt.

## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"J. G. K.," Murray Bridge, reports mare, five years, usually a free worker, but which during the last few days has shown inability to keep up with the rest of the team, more especially during the latter part of the day.

Reply—I should think that the case was one of inability, and not disinclination, for work, though the cause of the trouble is not at all clear. Possibly it is due to the effect of the paddy melon. This plant is generally regarded as a cause of blindness in horses, and the vine itself frequently causes obstruction of the bowel. It would be advisable to put her out of work for a week. Give her smashes, &c., soft food for a few days, and see that she does not have access to paddy melons.

Inquirer also reports mare with an enlarged joint following a cut on the leg.

Reply—It is not by any means certain that a blister will have the effect you desire, but if there is now no heat in the part you might try an application of red blister. Clip the hair off first. Rub the blister in for 5mins. Do not blister the bend of the joint. Tie the mare's head up short for an hour or so after blistering.

"A. J. D.," Keith, has cow which suddenly dropped in her milk yield from 3galls. to  $\frac{1}{2}$ gall.

Reply—Any serious departure from health may cause a big drop in the milk yield, but, in this case, the stiffness in the gait, the local heat in the udder, and the alteration in the milk indicates an attack of mammitis, or inflammation of the udder. It would be advisable to commence treatment by giving her a dose of purgative medicine. Give her Epsom salts 1lb., treacle 1 cupful. Dissolve this in a quart of lukewarm water, and give it to her slowly and carefully. Put her on half rations, and do not give her milk-producing food. Apply warm fomentos to the affected part two or three times daily. Milk out the affected quarters frequently. Give the udder plenty of gentle hand-rubbing, and after fomenting, dry thoroughly and apply a little camphorated oil.

Messrs. "W., B., and W.," Morgan, ask cure for two Jersey heifers which suck each other.

Reply—The usual method of preventing this is by means of the noseband of spikes which you mention. I would suggest that you try a sidestick, that is, a wooden rod with one end fixed to a headstall and the other to a surcingle. I do not know of any substance which will be effective if placed on the teats. If you cannot devise some mechanical means of preventing the heifers from suckling each other, they should be separated.

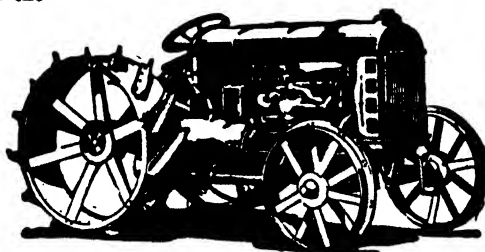
Hon. Secretary, Agricultural Bureau, Goode, asks:—(1) Are cattle subject to the same trouble with sand as horses; and (2) young pigs affected with violent trembling of the hindquarters soon after birth.

•Replies—(1) Cattle do suffer from the presence of sand in the digestive organs, principally in the second stomach. They are not as subject to this trouble as



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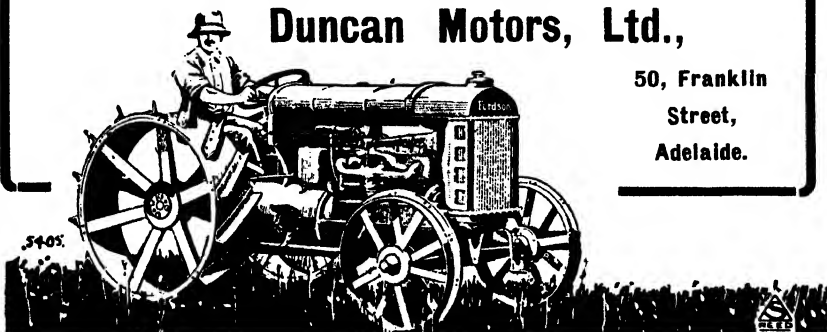
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horses, on account of their different manner of grazing. Cases of earth eating sometimes occur in cattle, especially in the absence of salt. (2) The probable cause of the trouble in sucking pigs is navel infection. This can be guarded against by providing clean, dry, well-ventilated sties, with plenty of sunlight, for sows to farrow in. Do not allow sow to farrow close to an affected litter or in a pen where an affected litter has been kept.

"S. E. W.," Block E, Renmark, reports three-year-old filly with a weakness of the legs, particularly after having a drink.

Reply—The trouble is probably of nervous origin, and may be chronic in character. Keep her in a small yard. Put her on light, easily digested food, and give her the following medicine:—Solution of strychnine, 6 drams; water sufficient to make 12ozs.; mix. Give two tablespoonsful twice daily in a little water. You may be able to judge of the probability of recovery by the effect of the treatment. If she shows no improvement, it is doubtful if she will recover.

"J. G. F.," Gladstone, has gelding with a lump below the eye and discharge from the nostril.

Reply—There is evidently some disease of the bone in the region. I would suggest that you obtain the use of a mouth gag, and examine the teeth. Conditions such as you describe sometimes arise from diseased teeth. If this is the case it must be removed.

"L. A. von D.," Halidon, reports horse with heavy cough and losing condition.

Reply—Try the following:—Green extract of belladonna, 4oz.; chlorate of potash, 1oz.; glycerine, 4ozs.; honey, 4ozs.; mix. One tablespoonful twice daily on tongue. A cough is only a symptom of disease. It would be advisable to put her out of work and put her on special feed.

"D. F. B.," Wilkawatt, has two horses with "puffy lumps" in the hollow on the side of the hocks.

Reply—This is "thorough pin," and is due to work. The condition is usually associated with straight hocks. These synovial swellings are difficult to treat. If you can put them on light work, try the following application. Any improvement, however, which takes place will do so gradually. Liniment of iodine, 4ozs.; Stockholm tar, 4ozs.; mix. Apply this to the swellings with an old brush once a day. When the skin becomes tender, discontinue for a few days, then reapply.

"E. G. V.," Brentwood, has stallion with skin irritation behind the wither.

Reply—This is a form of mange. I advise you to apply sulphur ointment, made by mixing one part of sulphur to four of lard. Wash the parts affected with warm water and soap. When dry, apply the sulphur ointment, rubbing well in for 5mins. If you give the parts you have dressed a hand-rubbing daily it will be helpful. Wash off in a week, and reapply. The treatment will be more effective if you first clip the affected parts. Two or three dressings should effect a cure.

Secretary, Agricultural Bureau, Shoal Bay, seeks information regarding the use of bluestone in the form of a lick for worms in sheep.

Reply—I do not think that the use of bluestone in this form will be satisfactory. It would not be wise to use more than 1lb. of bluestone to 100lbs. of salt, and it would require to be very thoroughly powdered and mixed. It would be necessary for a sheep to take 1½ozs. to 3ozs. of this mixture to obtain a dose. Bluestone is an agent which requires careful dosage to be effective. It is impossible to obtain this condition in a lick. You should, therefore, use bluestone solution.

"W. J. H.," Taplan, has mare, four years old, with a swelling under the belly in front of udder.

Reply—Swellings such as you describe are common in many diseases. It may be due to general debility. She is certainly not fit for work. Give her sufficient soft food to keep her bowels relaxed, and if you can obtain it, give her lucerne or other green feed daily. Give her one teaspoonful of saltpetre and 1oz. of Epsom salts in her drinking water daily. Do not keep her shut up in the stable, but let her run in a small yard or paddock. This swelling may be due to some trouble following retention of the afterbirth. If there is any discharge from the

Reply—She will require local treatment (douching). You should examine principally to this matter, and write again if necessary.

Hon. Secretary, Agricultural Bureau, Morechard, asks if dipping improves the fineness of wool.

Reply—Dipping does not improve the fineness of the wool, but it improves its condition.

Inquirer asks reason for death of cow, tongue black, and hanging out, slobbering at mouth, and stiff in forequarters.

Reply—The death of the cow was due to toxæmic paralysis, a disease closely resembling forage poisoning in horses. It may be caused by cattle chewing portions of dead animals, such as bones with dried and decaying matter attached to them.

Hon. Secretary, Agricultural Bureau, Lake Wangary, reports mare in good condition, after being brought in from paddock; worked in wagon for three days, when she became very sluggish, lied down, trembled violently, and died next day. Information is sought as to cause and treatment.

Reply—The mare probably had an impaction of the bowel. Treatment:—Give raw linseed oil, 1pt. to 1½pts., with a little turpentine; frequent and copious enemata of warm soapy water. Follow with tincture of nux vomica, one table-spoonful, two or three times a day, in a little water. If the appetite returns, careful feeding is necessary. Give light laxative food at first, and gradually return to ordinary ration.

“H. A. F.,” Carrow, reports horse gorged with wheat. For 36 hours after eating the grain the horse was quite blind.

Reply—The soda treatment to be effectual should be followed soon after the horse has eaten the wheat. The usual sequel to wheat engorgement is laminitis (founder), which should be treated with cold foot baths, light laxative diet, and cooling medicine, Epsom salts, &c. The eyes in the case described should be bathed twice daily with warm boracic lotion, made by dissolving one dessert-spoonful of boracic acid in a pint of water.

“G. P. S., Pygery Siding, has aged draught horse, with stiffness of the near fore leg and swelling of the fetlock.

Reply—This is probably due to an injury. Put him out of work. Apply warm fomenta. As he appears to have had previous trouble in regard to the feet, it would be advisable to inspect this region thoroughly for the cause of the stiffness (lameness).

Inquirer also reports heavy draught with swelling of the hind legs to the hocks.

Reply—You do not state the character of the swelling nor the length of time it has been present. It may be a chronic condition, such as one frequently gets in grease. In any case it would not be advisable to keep him in work in the very wet ground, which is probably aggravating the condition.

Hon. Secretary, Agricultural Bureau, Salisbury, reports heifer, which shows at times blood in the milk from one quarter.

Reply—It is not uncommon to find blood in milk for about a fortnight after calving. Blood in the milk may be due to local congestion or inflammation, as a result of injuries, or it may be caused by sudden change to rich and abundant feed. Occasionally it occurs when a cow is in season, or it may occur as a result of ulceration, &c., of the duct of the teat. Treatment depends upon the cause. If the quarter is warm and painful, give a purgative drench, and apply fomenta. If necessary, regulate diet. Milk the quarter carefully and thoroughly.

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90s. per ton on trucks, Port Adelaide.

**"CRUSADER" PETROL**

**Arthur H. HASELL, PORT ADELAIDE,**  
**MANUFACTURER and IMPORTER.**

## THE THIRD REPORT OF THE STATE EXPERIMENT ORCHARD, BERRI, RIVER MURRAY.

[By GEO. QUINN, Horticultural Instructor, &c., and C. G. SAVAGE,  
Manager.]

### INTRODUCTORY.

In this third report of the orchard the results of the 1919-20 and 1920-21 seasons, and the average returns for the four seasons ended June 30th, 1921, are quoted. Where the experiments have been commenced since 1917, the average returns are calculated from the data collected since the initiation of the various tests, in which case the number of years from which the figures are calculated are quoted.

Of the two seasons under review, that of 1919-20 proved to be one of the most successful that has been experienced since the establishment of the orchard. The yield of fruit was the heaviest gathered since the inception of the station in 1911, and the quality was equal to any previously grown. The drying season, on the whole, was all that could be desired, with the exception of the rains which fell from December 24th to 28th, when 104 points were recorded. Sultry weather conditions followed, with the result that apricots ripened rapidly, many falling from the trees before they could be gathered, consequently the percentage of slab fruit was higher than is usually the case.

The 1920-21 season opened well, and gave promise of heavy yields of all the fruits, with the exception of peach, apricot, and nectarine, these crops being much lighter than those harvested during the previous season.

The weather conditions prevailing throughout the drying season proved to be most disastrous, as rain fell on several occasions, and spells of sultry weather were experienced, which proved favorable for the



rapid development of moulds. Three severe heat waves were recorded—one between January 18th to January 26th, with shade temperatures varying from 93deg. to 119deg. Fahr.; the second from January 29th to February 1st, with variation in the temperature from 102deg. to 112deg. Fahr.; the third was recorded between February 8th to February 14th, when the mercury varied between 98deg. to 114deg. Fahr. in the shade. These heat bursts were accompanied by calm days or with very light south-east to easterly winds. Under these conditions the radiation of heat from the soil was intense, and those grapes which were not approaching the ripening stage were sadly burnt. The Sultana and Gordo crops suffered worst in this regard; the leaves of Doradilla vines were badly scorched, but the fruit was not damaged to any great extent.

Heavy rains fell from December 25th to 27th, when 1.46in. were recorded; a further fall a week later registered 1.86in. The harvesting of the apricot crop was sadly hampered by these untimely rains, and many neighboring growers lost much fruit. Fortunately, the harvesting of this fruit was well advanced at this station, so that the loss through the rain was not great.

The wet, sultry weather that prevailed during the period between February 20th to March 1st caused heavy losses in the currant, sultana, and fig crops. The rainfall between these dates was 285 points, and the maximum shade temperatures rose from 71deg. to 100deg. Fahr., and the minimum temperatures varied between 62deg. to 70deg. Fahr.; such conditions favored the rapid propagation of moulds upon the gathered fruit, while that hanging on the vines and trees was badly split, and much of it fell to the ground. The currant crop at the orchard had been practically harvested, and part had been dried, but the racks were still filled with partially dried and fresh fruit. Where the fruit was practically dry when the rain fell, mould fungi did not develop to a serious degree, but where fresh fruit was on the racks, these fungi grew rapidly. Some of the latter fruit was destroyed, and it was necessary, after the fruit had dried, to cleanse the remainder by passing it through a boiling lye (1lb. caustic soda to 30galls. of water), then through a clean water bath, to remove the soda, after which the fruit was re-dried. The Sultana crop, which was still on the vines, was badly damaged through the berries splitting, the development of moulds, and the loss through falling fruit. The dried fruit produced was, in consequence, of a lower grade than is the case in a normal season. The fig and prune crops were also similarly affected by the extraordinary weather, much fruit being lost.

### BIRD PESTS.

During the two seasons under review, little loss was experienced through the depredations of birds, the only damage worth recording being caused by crows upon the ripening apricots.

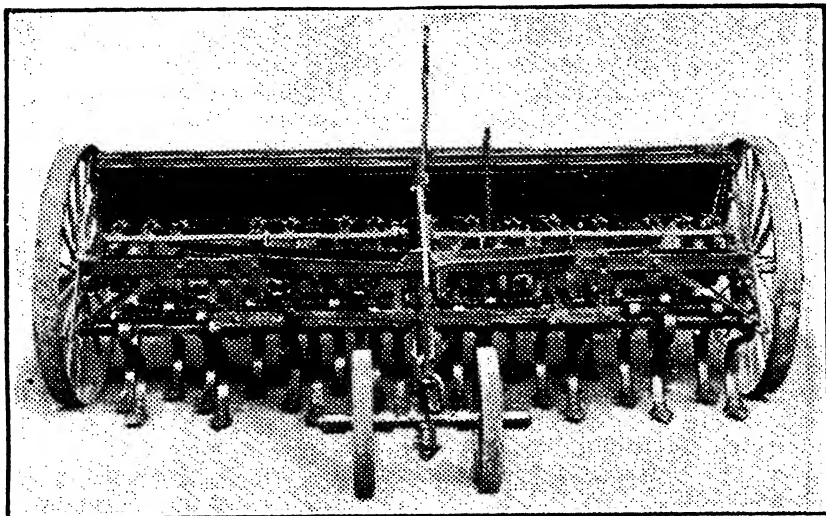
### FUNGOID DISEASES AND INSECT PESTS.

Oidium was noticeable through the vineyards in both seasons, but little damage resulted, as the disease was held in check by dusting flowers of sulphur over the vines. Anthracnose of the vine made its

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appearance during the 1921 summer for the first time, but owing to the infection being a very late one, which attacked the ends of trailing shoots of the Sultana vines, no damage to the crop resulted. Codlin moth was found for the first time in the pear plantation early in 1920-21 summer. The outbreak is widespread through the district. The dreaded downy mildew (*Plasmopara viticola*) also made its first appearance late in the season 1921, but only sufficiently to record same.

## WEATHER RECORDS.

TABLE I.—*Showing Distribution of the Rainfall from January 1st, 1919, to June 30th, 1921.*

Month.	1919.	1920.	1921.	Average for Eight Years.
January . . . . .	0.12	0.07	1.89	0.45
February . . . . .	2.70	0.01	2.62	1.12
March . . . . .	0.16	0.20	0.77	0.45
April . . . . .	0.49	0.63	nil	0.42
May . . . . .	1.03	0.66	1.23	1.09
June . . . . .	0.56	2.35	0.83	0.97
				Seven Years.
July . . . . .	0.33	0.38	—	0.82
August . . . . .	0.23	2.88	—	1.59
September . . . . .	0.42	2.15	—	1.15
October . . . . .	0.46	1.72	—	1.09
November . . . . .	0.93	1.17	—	0.86
December . . . . .	1.04	1.91	—	0.72
Total . . . . .	8.47	14.13	—	10.29

TABLE II.—*Mean Monthly Temperatures from July, 1919, to June, 1921.*

Month.	Shade Temperatures.		Ground Surface Temperatures.	Soil Temperatures, taken 2ft. below Surface.	
	Min. Deg.	Max. Deg.	Min. Deg.	Min. Deg.	Max. Deg.
July, 1919 . . . . .	37	62	32	50	51
August . . . . .	41	72	35	53	54
September . . . . .	16	74	10	66	68
October . . . . .	48	84	45	63	64
November . . . . .	55	85	51	69	71
December . . . . .	59	94	56	76	77
January, 1920 . . . . .	56	95	56	75	77
February . . . . .	57	95	55	76	77
March . . . . .	51	86	48	71	73
April . . . . .	49	75	43	65	66
May . . . . .	42	65	38	56	57
June . . . . .	43	60	36	52	54
July . . . . .	37	62	29	50	51
August . . . . .	41	63	32	51	52
September . . . . .	46	68	35	55	57
October . . . . .	50	79	40	62	64
November . . . . .	55	82	43	67	69
December . . . . .	58	88	43	71	73
January, 1921 . . . . .	60	93	46	75	77
February . . . . .	62	92	58	78	79
March . . . . .	54	85	49	72	74
April . . . . .	49	79	44	67	68
May . . . . .	48	72	42	62	63
June . . . . .	44	63	43	56	56

## AREAS PLANTED WITH FRUIT TREES, VINES, ETC.

TABLE III.—*Showing the Acreages Devoted to Each Kind of Fruit, Lucerne, Etc.*

	Acre.		Acre.
Citrus . . . . .	12½	Palms and passion fruit . .	½
Peaches . . . . .	2½	Walnuts . . . . .	½
Nectarines . . . . .	2½	Olives . . . . .	½
Apricots . . . . .	2½	House block, sheds, yards,	
Figs . . . . .	6½	roads, and drying green .	3½
Almonds . . . . .	2½	Lucerne . . . . .	5
Pears . . . . .	3	Castor oil plants . . . . .	½
Prunes . . . . .	4½	Not planted . . . . .	22
Apples . . . . .	½		
Vines . . . . .	10½	Total irrigable area . .	79½

## COVER CROPS FOR GREEN MANURING.

Cover crops of field pease and tick beans were sown during April in both seasons under review. The crops in both seasons grew well, and produced large quantities of green stuff, which was ready to plough under by July.

## EXPERIMENTS WITH DECIDUOUS AND CITRUS TREES.

## (1) PRUNING TESTS WITH APRICOT AND PEACH TREES.

An average of the crops produced during the last four seasons shows that the Royal apricot and the Early Crawford peach trees have given heavier yields when the trees were pruned to the "unstopped" leader system. The trees of Moorpark apricot and Elberta peach, on the other hand, have given increased returns where the leaders have been shortened back severely to definite dormant buds, as is usually practised in non-irrigated fruitgrowing centres. These results are more interesting when the varying habits of fruit bearing in the above varieties are recalled.

TABLE IV.—*Showing the Results from Pruning Tests—Apricots and Peaches.*

Variety.	No. of Trees.	Total Weight of Fresh Fruit, 1920.	Total Weight of Dried Fruit, 1920.	Total Weight of Fresh Fruit, 1921.	Total Weight of Dried Fruit, 1921.	Acre Average for 4 Years.		
						Drying Ratio.	Rate per Acre of Fresh Fruit.	Rate per Acre of Dried Fruit.

## THE "UNSTOPPED LEADER."

		lbs.	lbs.	lbs.	lbs.		lbs.	lbs.
Apricots—								
Royal . . . . .	3	875-00	152-25	571-00	119-50	5-31	16,484-31	3,104-56
Moorpark . . . .	6	1,001-00	174-00	698-00	130-25	5-67	10,053-18	1,774-22
Peaches—								
Early Crawford	6	743-50	134-00	148-50	21-00	5-76	5,806-25	1,008-59
Elberta . . . . .	3	213-00	35-50	77-50	14-25	6-06	6,765-62	1,117-18

TABLE IV.—(continued).

Variety.	No. of Trees.	Total Weight of Fresh Fruit, 1920.	Total Weight of Dried Fruit, 1920.	Total Weight of Fresh Fruit, 1921.	Total Weight of Dried Fruit, 1921.	Acre Average for 4 Years.		
						Drying Ratio.	Rate per Acre of Fresh Fruit.	Rate per Acre of Dried Fruit.
LEADERS PRUNED TO DORMANT BUDS.								
Apricots—		lbs.	lbs.	lbs.	lbs.		lbs.	lbs.
Royal .....	3	921.50	165.00	463.00	93.25	5.30	15,612.50	2,942.18
Moorpark ....	6	1,166.50	193.00	468.00	99.00	5.74	10,098.44	1,759.37
Peaches—								
Early Crawford	6	673.00	120.00	124.00	18.00	5.92	5,204.69	878.12
Elberta .....	3	334.50	60.50	142.50	22.25	5.94	8,353.12	1,403.12

## (2) MANURE TESTS.

These trials have not been carried out for a period sufficiently long to enable any definite conclusions to be drawn from them, the figures are merely quoted for what they are worth, and to follow on those quoted in the second report. The ploughing in of green lucerne in Test 18 was first done during the winter of 1920, consequently crop records previous to 1921 were not kept.

## (2) FERTILISER TESTS.

TABLE V.—Fertiliser Test with Peach, Apricot, and Orange Trees.

Trees planted 1911. Manuring commenced October, 1918. Each row constitutes a test. There are six orange, three apricot, and three peach trees in each row, but as each kind consist of two or more varieties, the results are recorded from each variety separately.

## ONE ELBERTA PEACH.

Test No.	Manures Applied, Rate per Acre.	1920.		1921.		Acre Average for 3 Years.		
		Weight of Fresh Fruit.	Weight of Dried Fruit.	Weight of Fresh Fruit.	Weight of Dried Fruit.	Fresh Fruit.	Dried Fruit.	Drying Ratio.
1	No manure .....	lbs. 208.00	lbs. 34.00	lbs. 144.00	lbs. 17.75	lbs. 13,712.50	lbs. 2,143.75	6.40
2	675lbs. superphosphate .	181.50	27.50	154.50	23.00	12,650.00	1,900.00	6.66
3	675lbs. bonedust .....	121.50	19.50	156.50	29.50	11,637.50	2,025.00	5.75
4	168lbs. sulphate ammonia	232.00	45.00	200.00	31.00	13,337.50	2,600.00	6.26
5	168lbs. sulphate potash	176.50	25.00	149.50	22.50	11,137.50	1,787.50	6.41
6	282lbs. blood manure	173.00	28.00	151.00	20.75	10,750.00	1,618.75	6.64
7	No manure .....	114.00	13.50	77.00	10.75	6,737.50	1,018.75	6.61
8	675lbs. superphosphate; 168lbs. sulph. ammonia	241.50	44.50	205.00	23.50	14,400.00	2,300.00	6.26
9	3½ tons stable manure ..	187.00	28.00	99.50	23.00	9,450.00	1,675.00	5.64
10	675lbs. superphosphate; 168lbs. sulphate potash	163.50	24.50	108.00	16.75	9,087.50	1,506.25	6.03
11	168lbs. sulphate potash; 168lbs. sulph. ammonia	139.00	21.00	120.50	23.25	8,712.50	1,518.75	5.74
12	675lbs. superphosphate; 168lbs. sulph. potash; 168lbs. sulph. ammonia; 1,350lbs. lime	105.5	19.00	145.50	19.50	8,150.00	1,337.50	6.09
13	Barrier row .....	193.00	32.50	185.00	18.50	8,425.00	1,350.00	6.24
14	Green manure crop every second year	63.00	8.00	58.50	15.50	3,112.50	612.50	5.03
15	Barrier row .....	136.50	23.00	31.50	5.75	6,075.00	1,149.75	5.31
16	Green manure crop every year (two rows) .....	139.00	20.50	199.50	28.25	5,856.25	821.87	6.51
17	Barrier row .....	Details not reported		99.00	16.75	7,425.00	1,256.25	5.91
18	Lucerne (two rows) ....			255.00	32.50	9,562.50	1,218.75	7.85

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land valuable.**

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swamps and marshy land into Valuable Grazing Areas.

Strawberry Clover is a wonderful Soil Improver. Yields an abundance of  
first-class Pasture and palatable Hay. Once established it requires no cultivation.

**BRUNNING'S SHELLED "TARWEI" IS THE BEST AND  
CHEAPEST SEED.**

Loss occasioned by dehusking is eliminated, as Brunning's Seed is  
already dehusked by special machinery, which does not injure the seed,  
but ensures a high percentage of germination.

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TABLE V.—(continued).  
TWO EARLY CRAWFORD PEACHES.

Test.	1920.		1921.		Acre Average for 3 Years.		
	Weight of Fresh Fruit.	Weight of Dried Fruit.	Weight of Fresh Fruit.	Weight of Dried Fruit.	Fresh Fruit.	Dried Fruit.	Drying Ratio.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
1	873-00	47-00	280-50	38-50	9,143-75	1,237-50	7-39
2	290-00	39-00	188-00	23-75	7,325-00	986-09	7-43
3	444-00	66-00	251-50	32-00	11,306-25	1,693-75	6-67
4	310-00	54-50	187-50	23-00	8,062-50	1,331-25	6-06
5	211-50	41-00	103-00	22-00	5,637-50	1,112-50	5-67
6	531-50	81-00	149-00	23-00	12,318-75	1,987-50	6-20
7	319-00	48-00	104-50	16-75	7,856-25	1,228-12	6-39
8	350-00	55-00	55-50	10-50	6,331-25	1,068-75	5-92
9	363-50	66-00	57-50	9-50	6,668-75	1,187-50	5-61
10	365-50	60-00	73-00	11-00	7,543-75	1,212-50	6-22
11	260-00	43-00	70-50	7-50	6,612-50	1,068-75	6-18
12	79-00	13-00	38-00	6-50	3,956-25	718-75	5-50
13	201-50	32-50	82-00	11-00	5,187-50	831-25	6-24
14	181-50	32-00	104-50	17-50	4,518-75	800-00	5-65
15	123-50	15-00	27-50	4-00	3,800-00	593-75	6-06
16	376-00	69-00	146-00	22-50	4,696-87	809-37	5-86
17	Details	not kept	70-00	13-50	2,962-50	506-25	5-85
18	Details	not kept	135-00	28-50	2,531-25	534-37	4-74

TWO MOORPARK APRICOTS.

Test.	1920.		1921.		Acre Average for 3 Years.		
	Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Drying Ratio.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
1	475-50	71-50	383-51	57-00	12,849-83	2,075-00	6-19
2	337-00	59-50	163-60	22-75	8,106-25	1,390-62	5-82
3	418-50	71-00	266-00	51-75	10,556-25	1,909-21	5-62
4	457-50	90-00	247-50	44-00	11,256-25	2,137-60	5-27
5	422-00	83-00	181-00	40-50	9,681-25	1,931-25	5-01
6	438-00	72-50	259-00	47-75	10,550-00	1,908-12	5-54
7	332-50	59-50	300-50	50-50	8,525-00	1,506-25	5-66
8	368-50	57-50	210-50	42-50	8,143-75	1,387-50	5-87
9	350-50	60-00	109-50	25-00	6,350-00	1,168-75	5-32
10	380-50	64-50	257-00	45-75	8,600-00	1,540-62	5-58
11	282-00	49-00	151-00	30-50	6,491-25	1,187-50	5-42
12	228-00	40-00	174-00	34-00	6,225-00	1,175-00	5-20
13	198-50	35-50	189-50	28-50	5,750-00	975-00	5-90
14	203-50	40-00	185-50	30-50	5,718-75	1,106-25	5-17
15	169-00	31-50	140-00	24-00	4,387-50	825-00	5-32
16	478-50	77-00	412-50	72-50	6,565-62	1,140-62	5-76
17	Details	not kept	198-50	40-50	7,443-75	1,518-75	4-90
18	Details	not kept	311-00	45-75	5,831-25	857-81	6-79

ONE ROYAL APRICOT.

Test.	1920.		1921.		Acre Average for 3 Years.		
	Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Drying Ratio.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
1	397-00	77-50	21-00	5-00	13,125-00	2,525-00	5-20
3	377-00	72-50	36-50	8-75	13,925-00	2,856-41	4-87
5	450-00	90-50	141-50	29-75	20,150-00	4,031-25	5-00
9	338-00	64-50	15-00	3-50	12,737-50	2,400-00	5-31
14	114-00	28-50	114-50	27-50	6,987-50	1,750-00	3-99
15	89-00	18-50	75-00	12-50	5,562-50	1,112-50	5-00
16	178-00	39-50	187-50	36-50	5,218-75	1,112-50	4-69
18 (part)	Details	not kept	184-00	44-00	—	—	—

TABLE V.—*continued.*

Test.	1920.		1921.		Acre Average for 3 Years.		
	Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Drying Ratio.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
ONE LATE RIVERSIDE APRICOT.							
2 .....	196-00	83-50	181-00	80-50	10,787-50	1,887-50	5-71
4 .....	189-00	40-00	229-00	41-75	11,262-50	2,298-75	4-91
6 .....	108-50	21-50	160-00	33-75	7,275-00	1,531-25	4-75
7 .....	51-50	10-00	111-00	22-50	4,575-00	900-00	5-08
8 .....	107-00	21-50	177-00	30-00	7,737-50	1,412-33	5-48
10 .....	85-50	17-00	105-50	12-50	5,562-50	900-00	6-18
11 .....	89-00	19-00	216-00	39-50	8,837-50	1,700-00	5-11
12 .....	36-50	8-50	142-50	26-75	4,825-00	956-25	5-05
13 .....	46-50	10-00	149-00	24-00	5,425-00	962-50	5-64
17 .....	Details	not kept	150-50	28-00	11,287-50	2,100-00	5-37
18 (part) .....	Details	not kept	141-00	26-00	10,575-00	1,950-00	5-42

## WASHINGTON NAVEL ORANGES.

Test No.	No. of Trees.	Acre Results.		
		1919.	1920.	2 Years' Average.
1 .....	6	1,700-00	1,412-50	1,556-25
2 .....	6	2,181-25	1,631-25	1,906-25
3 .....	6	4,162-50	3,275-00	3,718-75
4 .....	6	3,556-25	3,750-00	3,653-25
5 .....	6	3,418-75	3,387-50	3,403-12
6 .....	6	2,606-25	1,305-00	1,955-62
7 .....	6	1,675-00	118-75	896-87
8 .....	6	1,875-00	706-25	1,290-62
9 .....	3	1,200-00	282-50	731-25
10 .....	3	1,962-50	2,562-50	2,262-50
11 .....	6	2,981-25	1,380-00	2,180-62
12 .....	4	7,387-50	3,437-50	5,412-50
13 .....	5	5,962-50	2,378-12	4,420-31
14 .....	3	5,525-00	1,900-00	3,712-50
15 .....	2	5,550-00	412-50	2,931-25
16 .....	5	4,897-50	375-00	2,636-50
17 .....	2	Details not kept	651-25	—
18 .....	2	“	600-00	—

## LATE VALENCIA ORANGES.

9 .....	3	3,000-00	1,687-50	2,343-75
10 .....	3	7,200-00	2,387-50	4,798-75
12 .....	2	14,962-50	17,062-50	16,012-50
14 .....	1	9,975-00	10,547-50	10,256-25
15 .....	2	6,450-00	8,343-75	7,396-82
16 .....	1	11,775-00	737-50	6,281-25
18 .....	3	Details not kept	3,575-00	—

## (3) APRICOTS—TOTAL RETURN FROM PLOT.

From the accompanying table the Royal apricot shows to advantage in the weight of dried fruit produced per acre; against this must be set the extra cost in handling the crop. The fruit is mainly of small size, and the cost of picking and splitting is much heavier than in the case of Moorpark or Late Riverside varieties. The Late Riverside trees had never given payable crops until 1920, they then being in their ninth year.



TABLE VI.—*Showing the Results from the Apricot Block.*

Variety.	No. of Trees.	Acre Results.						
		1920.		1921.		Four Years' Average.		
		Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Drying Ratio.
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
Moorpark .....	100	11,103.75	1,844.45	6,968.02	1,265.81	7,716.35	1,313.95	5.87
Royal .....	26	18,689.42	3,302.31	7,443.75	1,531.82	12,842.32	2,385.84	5.38
Late Riverside .....	18	6,856.25	1,416.58	10,016.66	1,788.69	5,778.70	1,055.38	5.48

## (4) PEACHES—TOTAL RETURN FROM PLOT.

The Elberta has proved the better peach of the two varieties grown; it is a more consistent cropper, and bears a more even sample of peach than the Early Crawford.

TABLE VII.—*Showing the Results from the Peach Block.*

Variety.	No. of Trees.	Acre Results.						
		1920.		1921.		Four Years' Average.		
		Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Drying Ratio.
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
Elberta .....	54	8,020.14	1,351.39	6,345.14	959.72	7,819.09	1,262.49	6.19
Early Crawford .....	104	8,312.85	1,367.14	8,298.92	477.40	5,325.39	903.04	5.90

## (5) THE NECTARINE COLLECTION.

Many of the nectarine trees are planted on shallow, sandy soil overlying limestone rubble, consequently the trees are not making satisfactory growth. Others, particularly the Goldmine variety, are on the edge of the salt patch; some of the trees have died, and others are showing signs of distress. The Hardwicke's Seedling trees are planted in another block, on deep, rich, sandy soil.

TABLE VIII.—*Showing the Results from Nectarine Collection.*

Variety.	No. of Trees.	Acre Results.						
		1920.		1921.		Four Years' Average.		
		Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Drying Ratio.
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
Goldmine .....	50	3,038.21	592.24	1,023.31	278.36	1,907.49	273.82	4.77
New Boy .....	14	6,664.28	1,269.64	4,695.53	940.18	3,173.44	595.31	5.33
Zealandia .....	52	3,605.76	796.15	123.31	32.45	997.72	215.67	4.63
Lipplatt's Prolific .....	15	8,485.00	1,430.00	1,602.50	298.75	2,679.37	463.75	5.78
Hardwicke's Seedling .....	6	6,387.50	1,287.50	9,131.25	1,893.75	4,938.44	900.78	5.48

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## (6) SMYRNA AND CAPRI FIGS.

During both seasons under review the Smyrna fig trees have borne good crops of large, luscious fruits. In 1919, 336½lbs. of fresh fruit were gathered; in 1920, 3,369lbs.; and in 1921 the weight of fresh fruit gathered was 7,939lbs. The February rain destroyed all the fruit that was then approaching maturity on the trees, which is estimated at 1,653lbs., that being the weight of fruit gathered at the last picking just prior to the rain. The showing of fruit then on the trees, to be gathered within the next few days, was as great, if not greater, than that quoted. Taking this estimate as correct, under normal conditions 9,592lbs. of fresh fruit should have been gathered, being equal to, approximately, 4,360lbs. of dried figs.

Unfortunately, a considerable number of the fig trees were planted upon salty land, so that the weight given should, under normal soil conditions, be increased. To test what would be the return under normal conditions, 40 trees growing towards the centre of the plantation were selected. The fruit was gathered separately, and records kept of the yield. The weight of fresh fruit gathered was 2,616½lbs. Allowing for the estimated loss of 884½lbs. of figs by the rain, some 3,501lbs. of fresh figs were produced by the 40 trees. From these figures the estimated yield per acre of fresh fruit is 6,564lbs., and that of dried figs 2,984lbs. from trees in their eighth year.

The 1920 pack was placed on the Adelaide and Brisbane markets in 1lb. cartons, and the fruit sold readily. The finished article, when compared with imported figs, both from Turkey and California, more than held its own. There is evidence that the fig-growing industry has been given a fillip through the results obtained from the plantation at this orchard.

We are pleased to report that the showing of over-wintering Capri figs (known as the mamme crop), which contain the wasp (*Blastophaga grossorum*) is a good one. Our experience for the three seasons since the wasp has been established at the orchard lead us to conclude that the climatic conditions prevailing in the Murray Valley are highly favorable to the retention of this valuable insect.

TABLE IX.—Showing Returns from the Fig Block for Three Seasons.

Year.	Fresh Fruit in lbs.	Dried Fruit in lbs.	Ratio.
1919 . . . . .	336.50	147.00	2.29
1920 . . . . .	3,369.00	1,613.00	2.09
1921 . . . . .	7,939.00	3,513.00	2.26

\* 1,653lbs. destroyed on drying trays by moulds. Dried weight calculated from ratio obtained from remaining figs.

The figs, before packing, were graded by passing the fruit over the following sized sieves:—1½in., 1½in., 1½in., and 1½in. mesh. These four sieves gave five grades of fruit; the top three grades, designated 4, 3, and 2 Crown, were packed in 1lb. cartons, under the brand "Golden Figs of Berri," and lower two grades, 1 Crown and Manufacturers',

in 56lb. boxes. The manufacturers' grade consisted of the small and split figs.

TABLE X.—*Showing the Number of Figs to the Pound and the Percentage of Each Grade to the Whole Pack.*

Grade.	No. of Figs to lb.	Percentage of Pack
4 Crown . . . . .	14 to 16	16
3 Crown . . . . .	18 to 20	41
2 Crown . . . . .	22 to 28	18
1 Crown . . . . .	32 to 38	12½
Manufacturers' . . . . .	—	12½

#### (7) CITRUS TREES.

From 12½ acres of oranges, varying in age from seven to nine years, 335 cases of fruit were gathered in 1919, and 400 cases in 1920. From a half acre of mandarins of seven and eight years old, 34 and 81 cases of fruit were picked, respectively, in 1919 and 1920. The low yield of the oranges is due to the poor fruiting habits of many of the trees in the older portion of the grove. These trees, which were obtained from various sources when the demand for citrus exceeded the supply, appear to have been worked from a poor strain of Washington navel oranges.

#### CITRUS STOCK TRIAL.

The trees worked on orange and lemon stocks continue to grow well, and are commencing to yield valuable data. Some of the trees on Pomelo and Seville stocks are commencing to respond to the improved cultural operations and green manuring given to these trials, but in many cases it has been found necessary to work further stocks, and these trees will be set out to replace the backward ones in due course. The trees worked on the Japanese deciduous orange (*Citrus trifoliata*) stocks will be set out in the 1921 spring. The trees worked on lemon stocks have up to the present, in every instance but one, given heavier yields, over three seasons' returns, than the varieties worked on the sweet orange stocks; but it is too soon to pronounce further upon the subject.

TABLE XI.—*Showing the Returns from the Citrus Stock Trials.*

Variety.	Stock.	No. of Trees.	Acre Results.		
			1919.	1920.	Three Years' Average.
			lbs.	lbs.	lbs.
Buckeye Navel . . . . .	Lemon . . . . .	5	15	727-50	272-00
Buckeye Navel . . . . .	Orange . . . . .	5	—	75-00	82-50
Navelencia . . . . .	Lemon . . . . .	4	18-75	525-00	287-50
Navelencia . . . . .	Orange . . . . .	5	7-50	382-50	380-00
Thompson's Improved . . . . .	Lemon . . . . .	5	187-50	907-50	465-00
Thompson's Improved . . . . .	Orange . . . . .	5	—	112-50	102-50
Washington Navel . . . . .	Lemon . . . . .	5	382-50	2,932-50	1,205-00
Washington Navel . . . . .	Orange . . . . .	5	15-00	397-50	202-50
Golden Nugget . . . . .	Lemon . . . . .	5	—	457-50	287-50
Golden Nugget . . . . .	Orange . . . . .	5	—	30-00	10-00
Valencia Late . . . . .	Lemon . . . . .	5	525-00	4,200-00	1,815-00
Valencia Late . . . . .	Orange . . . . .	5	105-00	870-00	405-00
Mediterranean Sweet . . . . .	Lemon . . . . .	5	523-12	1,470-00	838-50
Mediterranean Sweet . . . . .	Orange . . . . .	5	48-75	217-50	105-00
Dancy's Tangerine . . . . .	Lemon . . . . .	5	7,027-50	7,747-50	5,527-50
Dancy's Tangerine . . . . .	Orange . . . . .	5	195-00	270-00	242-50

## (8) THE ALMONDS.

As previously reported, the best developed trees are of the varieties White Nonpareil, I.X.L., and Ne Plus Ultra, and these trees have also carried the heaviest weight of fruit.

## (9) THE PRUNES.

(Planted in 1914 and later.)

*D'Agen*.—This prune stands out from the other varieties under test as the most consistent cropper, and the quality of the fruit is superior to that of the other varieties. The dried fruit produced in the 1921 season was at the rate of 22cwts. per acre.

*Sugar*.—This variety has not up to the present been a regular cropper. Some seasons heavy crops are borne, and the following years only light crops are produced. The prune is large and of good quality, but contains a large pit, which detracts from its value.

*Splendour*.—The crops carried by the Splendour trees have not been equal in weight or quality to those gathered from the D'Agen trees. The best crop that has been borne by this variety was gathered in the 1921 season, when the weight per acre of dried prunes was equal to 1,900lbs.

*Coe's Golden Drop*.—The fruit from these trees again was badly scalded by the heat. The crop carried was a fair one, but the quantity of marketable fruit was greatly reduced by the number of sunburnt plums.

*Angelina Burdett*.—Gave fair returns, but the fruit was not equal in quality to the D'Agen.

*Giant Plum*.—This plum appears to flourish under the River Murray conditions, and bears heavy crops of large fruit. This variety closely resembles its parent, Pond's Seedling, and is a good jam sort, but is not suitable for drying into a first-class prune.

*Robe de Sargent*.—This prune is growing upon a salty patch of soil, and consequently is not giving the best returns nor the high quality fruit that is characteristic of it in other parts of Australia.

TABLE XII.—Showing the Returns from the Prune Plot.

Variety.	No. of Trees.	Acre Results.						
		1920.		1921.		Four Years' Average.		
		Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Fresh Fruit.	Dried Fruit.	Drying Ratio.
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
D'Agen .....	58	2,480-51	1,067-81	8,067-41	2,482-14	4,153-27	1,426-26	2-91
Splendour .....	25	3,187-86	1,160-07	6,019-92	1,898-64	2,601-56	868-76	2-99
Sugar .....	2	7,722-00	3,402-00	1,782-00	648-00	3,483-00	1,467-00	2-37
Robe de Sargeant .....	2	1,080-00	468-00	2,388-00	810-00	1,834-00	666-00	2-75
Coe's Golden Drop .....	30	238-24	96-88	2,156-40	663-30	1,116-77	376-20	2-97
Angelina Burdett .....	6	2,628-00	954-00	2,286-00	783-00	1,420-20	490-95	2-89
Giant .....	7	4,212-00	1,218-86	6,665-14	1,527-43	4,169-57	1,029-85	4-05

Unfortunately, seepage is showing in this block, the plot being situated just below the 40ft. channel, where the fringe of the sandy uplands overlaps on to the hard soil of the flat. The drainage from

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the higher slopes, flowing upon the firm sublayer, rises to the surface where the two soils meet. In consequence of this development, many trees in the centre of the block are dying. It is hoped before next winter, however, an effective system of under drainage will be laid down, which will carry away the seepage water and the injurious salts, and possibly save those trees which are not too seriously injured.

#### PRUNE AND PLUM STOCK TRIAL.

During the spring of 1920 some 2½ acres of land was planted to a "Prune and Plum Stock Trial." Twenty-four of the most promising varieties of European plums and prunes, selected from the Blackwood orchard, were set out, a dozen trees of each variety being worked upon almond, apricot, peach, and Myrobalana plum stocks. This experiment should, in the course of a few years, furnish some interesting data in relation to the prune in the Murray Valley.

#### (10) PEARS—WILLIAMS' BON CHRETIEN.

Most of these trees are responding to the subsoiling which was carried out in 1917 and 1918. Those which are not showing increased vigor are more or less affected by a root and crown gall.

The plot to which one ton each of gypsum and lime were applied in 1917 is showing increased yields over the plots where gypsum and lime were applied separately. On the whole, this block of pear trees is a very unsatisfactory and patchy plot, and illustrates the fallacy of planting on shallowly prepared ground.

TABLE XIII.—*Showing Results from Pear Plots.*

Soil Corrector applied 1917.	Rate per Acre.	Rows.	Total Weight of Fresh Fruit.			
			1919.	1920.	1921.	Average.
	Tons		lbs.	lbs.	lbs.	lbs.
Gypsum .....	2	1—4	225-50	929-00	1,060-00	738-16
Lime .....	2	5—8	154-50	820-00	1,173-00	715-66
Gypsum .....	2	9—12	428-00	1,536-00	3,339-50	1,767-83
Lime .....	1 }	13—16	411-00	1,502-00	3,688-00	1,867-00
Gypsum .....	1 }					

#### *Total Returns from Plot.*

1920—6,560lbs. of fresh fruit were harvested, of which 5,613lbs. were dried, giving 1,292lbs. of dried fruit, equal to 4.34lbs. of fresh to 1lb. of dried.

1921—11,844lbs. of fresh fruit were gathered. The total weight cut and dried was 9,309½lbs., from which 1,898lbs. of dried pears were obtained, giving a drying ratio of 4.90.

#### OTHER VARIETIES.

*Passans du Portugal (Lemon Bergamot).*—1920—45lbs. fresh fruit, 10lbs. dried fruit; drying ratio, 4.50. 1921—71½lbs. fresh fruit, 14lbs. dried fruit; drying ratio, 5.17. This pear is smaller than the Williams, is roundish in shape, dries out a good color, and is considered equal in quality to the Williams as a dried article.

*Beurre Diel.*—1921—12lbs. of fresh pears were dried of this variety, from which 3½lbs. of dried fruit were obtained, equal to 3.43lbs. of fresh to 1lb. of dried. The finished article was only fair, and was not equal to that of the Williams or the Passans du Portugal.

*Kieffers Hybrid.*—1921—From 22lbs. of fresh Kieffer pears, 4½lbs. of dried fruit were produced, giving a drying ratio of 4.89. The dried fruit was poor in quality.

### TESTS IN SULPHURING FRUITS.

The following sulphuring tests were designed to ascertain the effects upon certain fruits of confining them in receptacles of known capacities for prescribed periods of time, during which weighed quantities of sulphur are being oxidised, due observance being also made of the temperatures prevailing both inside and outside of such receptacles, and the weather conditions generally prevailing at the time.

Besides the pronouncements as to color fixing referred to herein, samples of fruits from each test are being submitted to the Department of Chemistry to determine the extent of the sulphur impregnation in each case. When these are available the whole of the results may be more fully reviewed.

#### (a) APRICOTS, 1919-20.

*Test 1.*—Box C: 12 trays Moorpark apricots; 1½lbs. sulphur. Weather—Warm, few clouds, light south-west wind. Box charged 10.45 a.m., 29.12.19. Temperature of box 76deg. when filled; 12 noon, 74deg.; 2 p.m., 86deg.; 3.30 p.m., 82deg. Fruit taken out at 3.30 p.m. = 4½ hours. Cups practically full of juice, sulphur nearly all burnt out.

*Test 2.*—Box D: 7 trays (mixed Moorpark and Royal), Moorpark test; 1½lbs. sulphur. Weather—Same as in Test 1. Box charged 5 p.m., 29.12.19; box temperature, 83deg. Fruit taken out 10 a.m., 30.12.19, = 17 hours; box temperature, 100deg. Cups not full, sulphur burnt out. Moorpark not as well done as Royals.

*Test 3.*—Box B: 12 trays Moorpark; 2lbs. sulphur. Weather—Clear sky, moderate south-west wind. Box charged 4.30 p.m., 30.12.19; box temperature, 92deg. Fruit taken out 10 a.m., 31.12.19, = 17½ hours; box temperature, 103deg. Cups overflowing, sulphur burnt out.

*Test 4.*—Box B: 12 trays Moorpark; 1lb. sulphur. Weather—Bright and warm, very light south-west wind. Box charged 10 a.m., 31.12.19. Box temperatures—10 a.m., 82deg.; 11 a.m., 99deg.; 12 noon, 106deg.; 4 p.m., 109deg. Fruit taken out 4 p.m., 31.12.19, = 6 hours. Cups full, sulphur burnt out.

*Test 5.*—Box B: 12 trays Royal; 2lbs. sulphur. Weather—Bright, light south-west wind. Box charged 2.15 p.m., 29.12.19. Box temperatures—2.15 p.m., 86deg.; 3.30 p.m., 111deg.; 4.45 p.m., 94deg.; 10 a.m., 30.12.19, 84deg. Fruit taken out 10 a.m., 30.12.19, = 19½ hours. Cups overflowing, ½lb. sulphur not burnt.

*Test 6.*—Royal, Box D: 7 trays (mixed Moorpark and Royal), 1½lbs. sulphur. Weather—Warm, few clouds, light south-west wind. Box charged 5 p.m., 29.12.19; box temperature, 83deg. Fruit taken out



10 a.m., 30.12.19, = 17 hours; box temperature, 100deg. Cups not full, sulphur burnt out. Royals better sulphured than Moorpark.

*Test 7.*—Box A: 12 trays Royal; 1½lbs. sulphur. Weather—Bright and warm, moderate south-west wind. Box charged 10.30 a.m., 30.12.19. Box temperatures—10.30 a.m., 80deg.; 1.30 p.m., 110deg.; 3 p.m., 110deg. Fruit taken out 3 p.m., 30.12.19, = 4½ hours. Cups just damp, sulphur not quite burnt out.

*Test 8.*—Box C: 12 trays Royal; 2½lbs. sulphur. Weather—Clear sky, moderate south-west wind. Box charged 3 p.m., 30.12.19. Box temperatures—3 p.m., 102deg.; 4.40 p.m., 106deg.; 10 a.m., 31.12.19, 104deg. Fruit taken out 10 a.m., 31.12.19, = 19 hours. Cups full, sulphur burnt out.

*Test 9.*—Box C: 13 trays Late Riverside; 1½lbs. sulphur. Weather—Few clouds, light south-west wind. Box charged 5 p.m., 29.12.19; box temperature, 78deg. Fruit taken out 10 a.m., 30.12.19, = 17 hours; box temperature, 98deg. Cups full, sulphur burnt out.

*Test 10.*—Box D: 9 trays Late Riverside; 1lb. sulphur. Weather—Few clouds, cool, moderate south-west wind. Box charged 3.30 p.m., 2.1.20; box temperature, 74deg. Fruit taken out 8 a.m., 3.1.20, = 16½ hours; box temperature, 60deg. Cups overflowing, sulphur burnt out.

#### 1919-20 Color Grading, September 8th, 1921.

These fruits were stored in packages until September 8th, 1921, on which date they were opened up, and classed for color.

TABLE XIV.—*Showing the Order in which the Various Varieties and Tests were Placed.*

Position.	Moorpark. Test No.	Royal. Test No.	Late Riverside. Test No.
1 . . . . .	3	8	9
2 . . . . .	2	5	10
3 . . . . .	4	6	—
4 . . . . .	1	7	—

#### APRICOTS, 1921.

*Test 1.*—Box B: 12 trays Moorpark; 1½lbs. sulphur. Weather—Bright, few thunderclouds in sky. Box charged 5 p.m., 23.12.20; box temperature, 118deg. Fruit taken out 9 a.m., 24.12.20; box temperature, 124deg. Cups full of juice.

*Test 2.*—Box C: 12 trays Moorpark; 1½lbs. sulphur. Weather—Bright. Box charged 5 p.m., 23.12.20; box temperature, 121deg. Fruit taken out 9 a.m., 24.12.20, = 16 hours; box temperature, 126deg. Cups full of juice, condition of fruit when sulphured similar to that in Test 1. Color of fruit on September 8th, 1921, identical in both tests.

*Test 3.*—Box B: 11 trays Late Riverside; 1½lbs. sulphur. Weather—Cool, moderate south-west wind. Box charged 2.30 p.m., 13.1.21; box temperature, 104deg. Fruit taken out 9 a.m., 14.1.21, = 18½ hours; box temperature, 86deg. Cups full of juice. Color on September 8th, 1921, very good.

## (b) PEACHES, 1919-20.

*Test 1.*—Box C: 12 trays Early Crawford; 2lbs. sulphur. Weather—Warm and cloudy, light north-west wind. Box charged 2 p.m., 19.1.20. Box temperatures—2 p.m., 118deg.; 5 p.m., 94deg.; 9 a.m. (20.1.20), 78deg. Fruit taken out 9 a.m., 20.1.20, = 19 hours. Cups nearly full, sulphur burnt out.

*Test 2.*—Box C: 12 trays Early Crawford; 2lbs. sulphur (1lb. sulphur ignited 11 a.m., and 1lb. ignited 5 p.m.). Weather—Cool, sky clear, moderate south-west wind. Box charged 11 a.m., 21.1.20. Box temperatures—11 a.m., 86deg.; 5 p.m., 100deg.; 8 a.m. (22.1.20), 72deg. Fruit taken out 8 a.m., 22.1.20, = 21 hours. Cups overflowing, sulphur burnt out.

*Test 3.*—Box B: 12 trays Early Crawford; 1½lbs. sulphur. Weather—Warm, sky clear, light south-west wind. Box charged 3 p.m., 20.1.20. Box temperatures—3 p.m., 102deg.; 5.30 p.m., 81deg.; 8 a.m. (21.1.20), 72deg. Fruit taken out 8 a.m., 21.1.20, = 17 hours. Sulphur not burnt out, juice just exuding.

*Test 4.*—Box C: 13 trays Early Crawford, 2½lbs. sulphur. Weather—Warm, few clouds, light south-west wind. Box charged 12 noon, 22.1.20. Box temperatures—12 noon, 80deg.; 5 p.m., 100deg.; 8 a.m. (23.1.20), 78deg. Fruit taken out 8 a.m., 23.1.20, = 20 hours. Cups overflowing, sulphur burnt out.

*Color Grading, September 8th, 1921.—Early Crawford.*

*Test 1.*—First position, color good.

*Test 2.*—Second position, color good.

*Test 3.*—Third position, color fair.

*Test 4.*—Fourth position, color dark.

## 1920-21 PEACHES.—EARLY CRAWFORD.

*Test 1.*—Box B: 12 trays Early Crawford, 1½lbs. sulphur. Weather—Cool, moderate south-west wind. Box charged 5.30 p.m., 11.1.21; box temperature, 74deg. Fruit taken out 8 a.m., 12.1.21, = 14½ hours; box temperature, 68deg. Juice just exuding.

*Test 2.*—Box D: 9 trays Early Crawford; 2lbs. sulphur. Weather—Cool, few clouds, south-west wind. Box charged 2.30 p.m., 13.1.21; box temperature, 78deg. Fruit taken out 9 a.m., 14.1.21, = 18½ hours; box temperature, 76deg. Cups, approximately, three-quarters full.

*Color Grading.*—Color of dried fruit in both tests equal, both good.

## ELBERTA.

*Test 3.*—Box C: 13 trays Elberta, 2lbs. sulphur. Weather—Warm and clear. Box charged 11.30 a.m., 20.1.21; box temperature, 130deg. Fruit taken out 8 a.m., 21.1.21, = 20½ hours. Box temperature, 94deg. Cups just overflowing. Color of dried fruit fair, little on dark side.

## (c) NECTARINES.

Box C: 12 trays Goldmine; 1½lbs. sulphur. Weather—Hot and cloudy. Box charged 3.30 p.m., 14.1.20. Box temperatures—3.30 p.m., 130deg.; 5 p.m., 101deg.; 10 a.m. (15.1.20), 98deg. Fruit taken out 10 a.m., 15.1.20, = 18½ hours. Cups full, sulphur burnt out. Color of dried fruit, September 8th, 1921, good.

Box C: 13 trays Lippiatt's Prolific; 1lb. sulphur. Weather—Cool, clear sky, moderate south-west wind. Box charged 2 p.m., 23.1.20. Box temperatures—2 p.m., 100deg.; 5.30 p.m., 100deg.; 8 a.m. (24.1.20), 82deg. Fruit taken out 8 a.m., 24.1.20, = 18 hours. Juice just exuding, sulphur not quite burnt out. Color of dried fruit on September 8th, 1921, dark.

TABLE X V.—*Showing Dimensions of Sulphur Boxes.*

Box.	Length. Ft. in.	Width. Ft. in.	Height. Ft. in.	Capacity in Cub. Ft.
A . . . . .	4 10	3 6	3 0	50.75
B . . . . .	5 0	3 10	3 9	71.87
C . . . . .	5 0	3 10	4 2	79.86
D . . . . .	4 9	3 6	2 6	41.56

### WHOLE DRYING OF APRICOTS.

Two tests were made in whole drying of Late Riverside apricots, the fruit in the one case being dipped in a boiling lye, made by adding 1lb. of caustic soda to 30galls. of water, before being placed in the sulphur box. The second lot of fruit was placed straight into the sulphur fumes without dipping in lye. In the first instance the fruit dried out a much brighter color than where the fruit was not passed through the lye dip. Further tests will be made with the whole drying of the apricot during the next season.

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## BLOWFLIES AND SHEEP.

[A PAPER, prepared by MR. F. E. PLACE, B.V.Sc., M.R.C.V.S., of Roseworthy Agricultural College, at the request of the Brentwood Branch of the Agricultural Bureau.]

In reply to a request from the Brentwood Branch of the Agricultural Bureau for information as to how to deal with the blowfly, the first remark I would make is that we must deal with blowflies, not the blow-fly, but blowflies in number, and of several different sorts, because during the last 50 years changes in the natural physical appearance of Yorke Peninsula have been bringing about the blowfly trouble gradually, without being noticed. While that trouble is in the aggregate costing Australia over £3,000,000 a year, it will not take another 50 years to increase it to £6,000,000, because every fly that produces maggots is the probable ancestress of hundreds of others capable of doing the same thing in the same season.

### EVOLUTION OF THE FLIES' HABITS.

Flyblown sheep are an excellent illustration of the proverb, "Opportunity makes the thief," because several sorts of blowflies have gradually changed their habits from being vegetable feeders or scavengers, till their maggots have become living parasites on sheep, so that the reply to the frequent question, "Which is the fly that blows sheep?" is that there are several kinds, and that some which do not actually do it now may do so in the near future.

The stages in the change are that flies were at first just vegetable feeders, then scavengers amongst decaying vegetable matter, and if this happened to be the contents of the paunch of a dead sheep it was only a slight change from dead vegetable to dead animal flesh. But in the dry Australian climate, dead flesh dries up more often than it putrefies, and dry material is not a good place to rear maggots in, so that it seemed better to lay the maggots on the skin of a dying sheep, whose tissues would remain moist long enough to allow the maggots to be reared. Then the sheep that was sick, but not actually dying, would also form a good incubator, and from that an irritated or bruised sheep or moist dags on an otherwise sound sheep would attract an adventurer, and, as already hinted, there are still others capable of taking a hand in the game.

### SEASONAL INFLUENCES.

In Europe and Asia flyblown sheep have been known for hundreds of years, but in Australia the last 10 or 12 years are those in which the trouble has begun to make itself acutely felt, and, speaking generally, warm, showery winters are most favorable to the development of insect pests. In fact, it may be noticed that in December and January there is comparatively little trouble, while in March it rapidly increases, reaching its height in May. Again in October there is another sharp rise. In cold, stormy weather the flies have to be sought for, sheltering in cracks of bark and similar positions, but in bright, sunny days

in winter, especially in mallee country, the survivors of last year's broods will come out and lay eggs, but the chief source of supply is the pupae hidden in the ground, formed from maggots that were dropped in the warm weather.

Although the mallee country has just been mentioned, and a few years ago that and dense scrub were noted for flies, nowadays one may expect the trouble in any class of country, and when, on looking over the flock, one notices a sheep standing apart, stamping its feet and switching its tail as if something were biting or stinging it, one may safely say that sheep is flyblown.

#### THE REGION OF ATTACK.

Though the region of the rump and soiled flank are the spots more favored by the flies, their attention is by no means restricted to those spots, and heads, shoulders, and elsewhere may be the points attacked. When the sheep is caught the wool is noticed to be discolored, dark, hot, and damp. These are the results of inflammation and the juicy moisture that the maggots cause. When the wool is opened out a stinking mass of matted wool and dead skin is found underneath and maggots of all sizes and ages, because when once a sheep is struck, other flies are attracted by the smell. If the sheep is not noticed, it will be, like the King of Judea, "eaten alive of worms."

The habit of giving common names, such as blowflies, blue bottles, etc., leads to a certain amount of confusion, for in different countries the names are interchangeable, but it is quite certain that the chief culprits are the two common yellow blowflies, often called "bush canaries," but they are helped in their work by four or five other varieties, such as the metallic green maggot fly, which so quickly appears on the scene whenever offal is available.

The blowing of lambs' tails after docking may be looked upon as an accident, and may be prevented to a large extent by dusting a little sulphur on. But it has been demonstrated by practice that if the tails are left two joints longer than usual, that the swish of those tails is useful in either preventing the fly from laying her eggs or in brushing them off when laid.

#### PREVENTIVE MEASURES.

Taken on the whole, prevention is a much more practical way of dealing with the question than trying to treat sheep that are struck. And when one considers that a quarter of a pound of meat is enough to rear a quarter of a thousand maggots into blowflies, the carcass of a bullock or sheep or a few score dead rabbits will go a long way towards keeping the teeming millions of flies well supplied with food.

Undoubtedly the most effective way of cutting off this food supply is to burn such carcasses, and, whenever possible, it should be done, even if labor has to be expended in collecting and cremating.

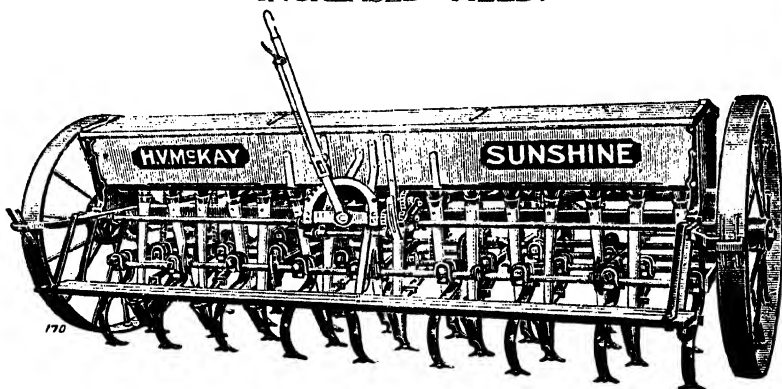
Where burning is not practicable, burying may be substituted, but it must be deep, for the maggots and pupae can work upwards through many inches of soil. Disinfectants like coal tar, kerosine, sheep dip, quick lime, are more than worth their cost, for such substances, even if they do not kill the pupae, so sterilise them that the flies produced are never active breeders.

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## THE VALUE OF BIRDS.

Wholesale destruction of birds and carrion-eating creatures has had much to do with the spread of blowflies and their rapid increase. Crows, eaglehawks, and so forth may be admitted to be a nuisance at times, but the harm they do is outweighed by the benefit. Not only do they destroy the maggots and carcasses, but while they are busy at work flies are kept at a distance. Poison baits and poisoned water have killed off many of the blowflies' enemies, and it may be laid down as a rule that the more birds there are the fewer flies there will be. Lizards of various sorts killed by poisoned water would have done good service in destroying flies and maggots. There is also a constant war going on between beetles and flies, and valuable service is done by small wasp-like insects that destroy the pupae. Carelessness in realising the fact that maggots become flies, and that flies are the parents of innumerable maggots, is really the cause of the rapid spread of the fly plague. Maggoty wool is clipped off and left on the ground, and in a few days the maggots that have buried themselves become pupae, which in another week will become flies, ready to infest the next flock that comes along, so that drafting yards become a centre of fly activity.

When dressing blown sheep, all maggoty wool should be collected and destroyed, either by burning or burying with lime, sheep dip, or kerosine. And it would be better, when dressing blown sheep, to stand them on a sheet or bag to prevent the maggots getting into the earth, which they do very quickly otherwise. The soft soil of the yards becomes an ideal breeding place for blowflies.

## KILLING THE MAGGOTS.

One would think that a soft, easily squashed thing like a maggot could be easily killed, but, as a matter of fact, they are very tenacious of life, and lots of things that seem to kill them lose their poisonous effects after a short time, and the maggots are as lively as ever. Essential oils like turpentine will kill them if they remain in contact with it for 8mins. or 10mins. They may be left all night in ordinary sheep dip solutions, and if taken out in the morning and put in damp earth will regain their liveliness. But when a reliable arsenical dip is used to saturate the wool thoroughly, the maggots are usually killed in a few hours. The reason for this is rather contradictory, it being first of all necessary to make a solution that will come in contact with the maggots' bodies all over, and prevent them working in the tissues to produce their peculiar moisture, and at the same time coagulate the albumin of the tissues, because the one thing that puts a stop to maggots working is dryness, and this is ensured as the moisture of the solution evaporates, and leaves the constituents of the dip in a very fine impalpable powder.

Whenever there is moisture on a sheep there will be maggots; wherever there are maggots there will be moisture; where there is no moisture there will be no maggots, but it may be readily seen that if they are driven from one spot they will choose another, and by their activity produce the moisture necessary.

Realising these facts, one sees that the method of procedure is to clip away affected wool, and then open out each maggot run to the end, when, if a volatile oil like petrol is poured on to them, they will come tumbling out. Probably not all are removed in this way, but the remainder may be killed by applying a little solution of 1 drachm perchloride of mercury in a pint of methylated spirit, or, if the latter is thought to be too dear, water may be used, but not so effectively. A rough way of measuring is as much perchloride as will lie on a shilling to a whisky bottle of spirit or water. A wound so dressed soon dries, and remains dry.

#### A REPELLANT DRESSING.

But it would seem that the crying need to-day is a dressing that can be applied to repel the fly and prevent her laying her maggots. There are many preparations on the market, some of which seem to be of very little use, and others reputed to be useful do not seem very practical. But a standard arsenic dip may be relied on for effectiveness in this way, when sheep are dipped as soon as the wool is long enough to hold the dip after shearing, and again two or three months later in bad districts. The cost of labor and material is lower for such handling than it is for the application of local dressings.

The question of crutching or not crutching is one on which much may be said on both sides. I think it pays to crutch dirty sheep, but I am equally convinced that crutching is not an essential part of treatment, and I will even go further, and say that in the case of clean sheep it is a disadvantage, as the long wool holds the preventive better.

In the case of the station flock, the quickest and most effective way of treating sheep is "jetting," and the cost of pump race and labor is repaid over and over again by sound sheep and time saved. But in the small flock the expense is not warranted, but effective treatment can be given by making a solution of sheep dip double strength in a tub, in which the sheep can be sat for a minute, with reliable results, and when the fly is bad such a procedure more than pays for itself in protecting sheep.

Many people pin their faith to bluestone, and, in conjunction with methods just referred to, a solution of 1 per cent. to 5 per cent.—that is twice to 10 times as strong as one would use for pickling wheat—is very useful in destroying maggots and assisting healing, but it has the disadvantage of discoloring a larger area of wool.

#### TRAPPING FLIES.

We have the satisfaction of knowing that when we have killed a maggot we have killed a prospective fly, and on the whole it is easier to chase and slay a maggot than it is to swot an elusive fly; but every fly is the prospective parent of hundreds of maggots, and while it is a useless task to chase them, they may be fairly easily induced to enter traps, and where they are numerous no effort should be spared in trapping. There are numerous forms of traps on the market more or less well adapted to catch flies, and as a rule the simpler the scheme the more flies will be caught. Details of a simple trap appeared in the *Agricultural Journal* a few years ago, and the most effective ones are, like it, based on the plan that flies will creep through a small hole



into a trap. They then get flustered, and always try to get out at the top, apparently forgetting how they got in.

A very simple and effective trap is a kerosine tin with the top cut off, and replaced by wire gauze or cheese cloth, with two or three small conical holes rather less than a threepenny piece in diameter along one edge. A bait of liver or meat is put in the tin and the cover put on, and the tin laid on its side so that these are on the lowest edge. The flies do the rest, except the can of boiling water that settles them later on. A variation of this idea, in which a pan of kerosine and formalin rests in the tin under the meat, is very deadly to flies. Dozens of such traps can be easily and cheaply made, and are very useful where offal is about, as well as in the paddock. But in isolated paddocks it is sometimes handier to poison a carcass, and that will kill myriads of flies before it gets too dry to be effective.

The poison is made by boiling 1lb. of white arsenic with 2lbs. of washing soda and 3lbs. of sugar in a kerosine tin for a couple of hours, keeping the tin full of water. Then pour a third of it into each of two other tins, filling them and the original nearly full of water. One tin splashed all over the carcass will attract and kill the flies.

To sum up—We have to remember that flies are taking up the blowing habit.

That prevention is far easier than cure.

That dead animal offal and fermenting matter are the reservoirs that keep up the supply of flies.

That arsenic in 1 per cent. solution is certain death to blowflies and maggots.

By its systematic use a stretch of country can be cleared of flies.

Neglect one year means millions more flies the next.

The way to check the pest is by carefully concerted action and continuous war on both maggots and flies.

No specific, however good, will be effective without brains.

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## THE APPLE ROOT BORER.

[By JOHN B. HARRIS, Orchard Instructor and Inspector.]

This is the common name given to at least three different species of insects which attack fruit trees; all three belong to the same genus, and they differ most apparently in size and coloring. The species best known in the Northern District is *Leptops rhizophagus*, and it has been responsible for considerable damage to apple trees in small portions of the districts of Stanley and Wirrabara Forest.

At this time of year (February) the most obvious evidence of a tree being attacked will probably be the withering, during a hot, dry spell, of leaves on certain branches or shoots; the leaves in the course of a few days become brown and dry, but do not fall readily, while other foliage on the tree remains green and healthy. In the case of trees of eight to ten years of age, one-third of the tree may suddenly die in this way, and unless the ravages of the pest can be checked, the remainder of the tree will probably follow suit. This sudden withering of the foliage and young shoots is due to the partial destruction of the root system of the tree by the larvae or grubs of the above-named insects.

The insect itself is a beetle belonging to the family *Curculionidae*, of which the better-known commonly-called "Curculio" beetle is an example. In structure the apple root borer is not altogether unlike the Curculio on a large scale, excepting in color. The general color of *Leptops rhizophagus* is grey; the head is mostly black, and consists largely of a snout or proboscis; the middle or thoracic segment is rather more black on top than on the sides and under surface, which are grey; the abdominal segment, covered on top by the wing cases, is marked by six raised serrated lines, which are black, the intervening hollows being grey, with a distinct orange tint towards the junction with the thorax, giving the beetle a very pretty appearance, which it appears to lose to some extent after death. The male and female insects may be found on the trees, usually paired, during October; where present, they are sometimes noticed at the time of the first codlin moth spraying. The female is larger than the male, but both sexes vary in size with different individuals; two specimens before me are eleven-sixteenths and nine-sixteenths of an inch in length, respectively.

### EGG-LAYING HABITS.

Shortly after copulation has taken place, the female deposits a clutch of approximately 50 eggs between two leaf edges, which she has drawn together by means of her legs, and which she seals around the eggs with a sticky secretion which soon becomes hard. The eggs

are laid in rows of from five to ten, a number of rows going to form a clutch; they are about one-tenth of an inch long, cylindrical, with rounded ends, yellowish-white, shining and sticky when newly laid. Each female is capable of laying more than one clutch of eggs, and apparently does, so that the number of eggs produced by each pair of insects must be considerable.

The mature insects may be poisoned by spraying the foliage with a strong lead arsenate spray, as they devour the foliage to a certain extent, and the spray will doubtless prove effective against the newly hatched grubs, as they eat their way through the leafy wall of their nest.

Very probably many of the newly hatched grubs, which are legless, are destroyed by the preying of other insects, but some travel to the roots of the tree, and it is here that the greatest damage is done. The grub found on the roots or in the soil is legless, and yellowish-white in appearance, with a brown head; its length varies from the newly hatched specimens found on the leaves, scarcely one-eighth of an inch in length, up to the fully grown larvae, which are half an inch to three-quarters of an inch in length when about to pupate.

#### THE DAMAGE.

The grubs destroy trees by feeding on the butt and main roots, but do not appear to attack roots much under half an inch in diameter; the grubs, as they feed, cut twisting channels in the surface of the roots in all directions, and such channels are about one-quarter of an inch in width. The grub is rather oval in shape, and flat on the under side. During the late winter months the grubs may be found in small oval cavities excavated in the soil; it is presumed that they pupate in these cavities, and appear from them as mature beetles in the spring. The grubs have been found so far only in very moist soil of a somewhat clayey nature, at a depth of from 10in. to 20in.; and a peculiarity of the beetle is that so far it has been found only in country where there is a very heavy growth of timber and excessive rainfall. The beetles appear to live in a natural wild state on the native timber, and it is where orchards are planted adjacent to heavy native timber that fruit trees are subject to attack. These insects cannot fly, and on that account their depredations do not become rapidly distributed; when trees are attacked, the spread of the pest is usually around the tree upon which the attack started. Affected trees have been cut very hard back, after the "die back" has been observed, causing them to push out fresh young growth; but this practice does not appear to have been practically successful.

#### PROTECTIVE MEASURES.

The best means of combating this pest known so far is by means of placing a zinc collar around the trunk of the tree in such a way as to prevent the insects ascending to lay their eggs. This should be done in the case of all trees which are liable to attack. Spraying with a strong solution of lead arsenate is, as previously stated, recommended to destroy the mature beetles and newly hatched larvae.

## ORCHARD NOTES FOR SOUTHERN DISTRICTS.

[By C. H. BEAUMONT.]

Apple picking and packing will be the principal work this month. A lot of good fruit has been badly marked by hailstones. This fruit should not be packed for export; its appearance is against it, even though its food value has not been diminished. Grading for export must be more carefully done than before, both for size and color, and in no case should scabby fruit or that damaged by codlin moth be packed. There is no need to have much of either in any carefully managed orchards; spraying has proved its value where systematically used. Use good cases and see that they are properly certified and branded.

For the cool store, pack medium-size fruit, from trees seven years old or over, which has had a day or more in the packing-shed. Do not pack hot off the tree. For local use try grading for size and quality; it pays.

Where fungous pests have been troublesome spray well before the leaves fall. Use Bordeaux mixture; this applies especially to cherries and Japanese plums. If you have to replace any trees, get the old ones out early and open the land. Burn a heap of rubbish in the hole if you can; it will help to get rid of any spores in the soil. This is recommended particularly in the case of trees removed on account of "crown or root gall."

Do not waste fruit; if you cannot deal with it yourself, buyers are asking for fruit suitable for evaporating or vinegar making.

Pamphlets on drying, &c., are available on application.

Pruning may be commenced on apricots and peaches, especially in the late ripening parts; do not cut out the leaders until winter. Apples may be thinned out by cutting back the lateral growths, and pears may be treated the same. It is good practice to remove from vines the rods which have borne the season's grapes.

Oranges which do not set their fruit well may be cinetured by using the blade of a table knife and cutting well through the bark at setting time. A twitch of No. 10 fencing wire may be used instead of the knife, but it is liable to bruise the bark.

Order trees for extending the orchard.

## ANALYSES OF FERTILISERS.

The following are the results of analyses made by the Government Agricultural Analyst (Mr. C. E. Chapman) of samples of fertilisers taken by Assistant Inspector Hunter during the year ended December 31st, 1921:—

Name of Firm and Fertiliser.	Phosphate.						Nitrogen.		Potash, K <sup>2</sup> O.		Bone Manure, Fine Material.		Phosphate Fertiliser, Fine Material.	
	Water Soluble.		Citrate Soluble.		Acid Soluble.		Vendor's Guarantee	Result of Analysis.	Vendor's Guarantee	Result of Analysis.	Vendor's Guarantee	Result of Analysis.	Vendor's Guarantee	Result of Analysis.
	Vendor's Guarantee	Result of Analysis.	Vendor's Guarantee	Result of Analysis.	Vendor's Guarantee	Result of Analysis.								
Adelaide Chemical & Fertilizer Co., Ltd.—														
Guano super. ....	27.0	23.9	88.5	—	7.9	3.0	—	7.4	—	—	—	—	—	—
Mineral super. ....	36.0	36.2	100.6	—	—	—	—	—	—	—	—	—	—	—
S.A. super. ....	30.0	33.5	111.7	—	—	—	—	—	—	—	—	—	—	—
Cresco Fertilizers, Limited —														
36 super. ....	36.0	42.2	117.2	—	—	—	—	—	—	—	—	—	—	—
45 super. ....	45.0	45.7	101.6	—	—	—	—	—	—	—	—	—	—	—
50 phosphate .....	20.0	24.8	124.0	4.0	2.0	26.0	—	28.2	—	—	—	—	75.0	99.0
Wallaroo-Mount Lyell Fertilizers, Ltd.—														
Adelaide super. (Y.P.) .....	30.0	30.3	101.0	—	—	—	—	—	—	—	—	—	—	—
Bonedust .....	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bone sup-r. ....	15.0	16.2	108.0	15.0	13.3	4.0	—	41.8	—	—	40.0	51.5	—	—
Guano super. ....	27.0	30.2	111.9	3.0	3.6	3.0	—	7.6	—	—	—	—	—	—
J. J. G. E. ....	28.5	29.5	103.5	4.5	4.5	5.0	—	4.4	—	—	—	—	—	—
Wallaroo-Mount Lyell standard super. ....	36.0	35.8	99.4	—	—	—	—	—	—	—	—	—	—	—

February 3rd, 1922.

Geo. Quinn, Chief Inspector of Fertilisers, &amp;c.

# RIVER MURRAY HERD TESTING ASSOCIATION.

## RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1921.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during November.	Per Cow during November.	Per Cow October to November.	Per Herd during November.	Per Cow during November.	Per Cow October to November.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/A	13	10-60	6,459	496-85	1,237-62	276-96	21-30	55-60
1/C	27	25-97	23,309	863-30	1,720-16	945-47	35-02	72-47
1/E	15-70	11-47	6,932	441-53	1,060-47	321-51	20-48	48-30
1/G	49	39-70	38,852	792-90	1,635-43	1,498-58	30-58	62-39
1/I	10	8	7,290	729-00	1,545-90	278-16	27-82	60-80
1/J	15-30	12-30	8,980-5	586-96	1,226-30	390-90	25-55	51-70
1/K	15-17	13-20	11,155	735-33	1,441-96	456-33	30-08	61-29
1/L	13	9-93	7,204	554-15	1,157-46	335-75	25-83	56-74
1/M	18-70	14-77	9,429	504-22	961-03	409-05	21-87	43-91
1/O	29	26	15,750	543-10	1,221-53	705-10	24-31	55-42
1/R	18-50	16-50	5,220	282-16	695-11	254-13	13-74	33-46
1/S	15	13	7,740	516	1,178-78	350-25	23-35	52-48
1/T	12	7-30	4,554	379-50	796-71	231-27	19-27	38-97
1/U	14	7-47	6,242	445-86	900-90	253-35	18-10	38-81
1/V	16	14-20	7,602	475-13	963-44	308-28	19-27	40-69
Mean	18-76	15-36	11,114-57	592-52	626-18	467-67	24-93	26-77

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**ADLAIDE**

## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, February 8th, there being present Mr. C. J. Tuckwell, the Director of Agriculture (Professor Arthur J. Perkins), Capt. S. A. White, Col. Rowell, and Messrs. W. S. Kelly, Geo. Jeffrey, H. Wicks, F. Coleman, and the Secretary (Mr. H. J. Finnis).

*Imperial Preference for Dried Fruits.*—A notification was received from the Minister of Agriculture, detailing the steps that had been taken in the direction of securing Imperial preference for dried fruit.

*Compulsory Spraying of Orchards.*—The Conference of River Murray Branches carried the following resolution, "That the spraying of all pear, apple, and quince trees and vines be made compulsory, and that a salaried officer be appointed to supervise the work, and that legislation be introduced to allow of the formation of local boards to control the operations." Messrs. W. G. Auld and H. Wicks were appointed a subcommittee to consider the resolution, and they have supplied the following report:—"(1) Insofar as downy mildew is concerned, it is desirable that spraying should be made compulsory with such mixtures, and at such times, as shall be determined by the horticultural instructor or his representative, in consultation with a committee consisting of no fewer than three or more than seven vinegrowers, selected by the Branch of the Agricultural Bureau, situated in the district concerned; or in the absence of a Branch of the Bureau in any district, or in the event of the Branch neglecting to select representatives, by the Horticultural Instructor or his representative. (2) That an inspector under the Vine, Fruit, and Vegetable Acts be appointed for the Murray Valley fruit and vinegrowing settlement. (3) That section 6 of the Vine, Fruit, and Vegetable Protection Act, 1885, be rigidly enforced. This section provides:—'Every person who shall, during the continuance of any prohibition, land in or otherwise introduce into the province, or attempt to land in or otherwise introduce into the province or be concerned in landing in or otherwise introducing into the province any insect, tree, plant, or other thing, contrary to any such proclamation, or, except in accordance with the regulations for the time being in force, or who shall keep, or sell, or expose, or offer for sale, or in any manner cause the distribution of any living insect of the kind prohibited in any stage of existence, shall, on conviction for every such offence, forfeit and pay a sum of not less than £5 nor more than £100, or be liable to be imprisoned for any period not exceeding six months.' " On the motion of Mr. Geo. Jeffrey, it was decided that the decision reached by the subcommittee should be sent on to the Minister, with a covering minute recommending the adoption of the matter.

*Water Rates on Eyre Peninsula.*—The 1921 Conference of Eyre Peninsula Branches of the Agricultural Bureau carried the following resolution, "That this Conference strongly urges that the rates charged for water on all tanks and wells on Eyre Peninsula be considerably

reduced." The resolution was transmitted to the Engineer-in-Chief, who has supplied the following report:—"While the authorised rates for water conservation supplies apply to the West Coast district, they are not in force on a great many of the supplies, as they are not at present under control. The landholders in the neighborhood of the tanks have had an opportunity of combining to form trusts to take leases of the water supplied at a rental which is equal to a very small charge per thousand gallons of water. In view of the difficulty of leasing water supplies on the West Coast, and the high cost, I do not recommend a reduction of the rates." The Secretary was instructed to advise the 1922 Conference of the decision of the Commissioner for Public Works.

*Market for Cured Pork.*—At the recent Conference of Murray Lands Branches of the Agricultural Bureau, the following resolution was carried, "That the Advisory Board approach the Government, with a view to their undertaking steps to find a market for cured pork." The motion was forwarded to the Manager of the Government Produce Department, who has replied as follows:—"There are good markets for fresh pork and cured pork in Australia and in the United Kingdom, and these markets have been good for many years. To-day's price (January 20th, 1922) for bacon in Adelaide is 1s. 2d. per lb., and if these prices are not an inducement to grow pigs, the industry will never flourish. Notwithstanding the very heavy over-supply of meat in England to-day, good imported fresh bacon pigs are worth, approximately, 10d. per lb., and this is calculated to net from 6d. to 7d. per lb. to the grower; this also should be an inducement to grow pigs. The department is receiving so many requests of the above nature that I am beginning to think the producers are looking for something almost impossible in the way of inducement and prices, and I would therefore suggest that the districts who are evidently taking some interest in the matter be requested to supply a statement showing what, in the opinion of their individual members, is necessary both as regards price and constancy of market for them to systematically produce pigs for local and exports markets." On the motion of Mr. Geo. Jeffrey, seconded by Mr. W. S. Kelly, it was decided to transmit the following resolution to the Minister, "The Board is in entire agreement with the ideas expressed in the accompanying bulletin by the Director of Agriculture, and will be glad to have any comments thereon that the Manager of the Produce Department might like to make."

*Eradication of St. John's Wort.*—In the annual report of the Orchard Instructor for the Southern districts notice was drawn to the spread of the weed St. John's Wort. A report on the subject was received from the Secretary of the Minister of Agriculture, suggesting that experiments might be undertaken by the department in the Coromandel Valley orchard, to ascertain the best methods of dealing with the weeds. On the motion of Mr. G. Jeffrey, it was decided that the Secretary should interview the Minister, and inform him that the Board were very much in earnest on the matter, and would be pleased if he would take action to eradicate the pest.



# KARSWOOD COW DRINKS

## have been curing sick cattle for over thirty years.

**CATTLE** were never so valuable as they are to-day. Most herds are far removed from veterinary assistance, and the owners must rely on themselves or their herdsmen for that quick and certain treatment that may mean the life of a fine beast.

A **KARSWOOD COW DRINK** is the reliable first aid for sick cattle. It is a reliable purgative—compounded from an old original formula in constant and successful use for over 50 years

One very experienced cattleman says—

"In nine out of every ten cases of sickness in cattle it is purging that will cure them. . . . I could not describe all the cases where I have used it—they are too numerous. . . . I give it to all ages, including calves—quantity according to age and size."

Another cattle-breeder, after many years of use, says—

"Find nothing to equal **KARSWOOD COW DRINKS**, especially in very urgent cases where quick purging is necessary."

## CALVING TIME.

Nowadays the high condition in which dairy cows are kept renders them liable to some risk at this period. Careless or inconsistent management frequently results in milk fever or cleansing troubles.

## Best Method of Management.

For three weeks before calving the cow should be kept on dry foods, and a **Karswood Cow Drink** given each week. After calving she should be milked clean and served with a pailful of thin, well-prepared, warm oatmeal gruel. For a few days she should have bran mash, the water should be given warm, and she should be milked three times a day. Served twelve hours after calving, a **Karswood Cow Drink** will clear the system, and for this purpose the **Karswood Cow Drinks** are held in very high repute by farmers who have used them for 50 years

**Price, 1s. 6d. per tin.**

If your own dealer cannot supply, send a postcard to the Importing Agents for your State (address below) asking the name of the nearest dealer who supplies **KARSWOOD COW DRINKS**.

# S.A. Milling & Trading Co., Ltd.,

**BAKER STREET - - PORT ADELAIDE.**

*If supplied direct, postage is charged extra.*

*Appointment of Inspectors.*—A resolution was received from the Lone Gum Branch dealing with the appointment of inspectors. It was decided to suggest that the Branch might communicate direct with the department concerned.

*Rail Freight on Blood Stock.*—A communication was received from the Rendelsham Branch, complaining of the excessive freights charged on the carriage of blood stock. The Secretary was instructed to obtain particulars regarding freight charges on pedigreed stock from the other States of the Commonwealth, and submit the particulars to the next meeting of the Board.

*Time of Fixing f.a.q. Standard.*—A resolution was received from the Gawler River Branch, asking the Advisory Board to endeavor to induce the Chamber of Commerce to fix the standard of f.a.q. wheat at least one month earlier. On the motion of Mr. W. S. Kelly, seconded by Mr. F. Coleman, it was resolved, "That the attention of the South Australian Chamber of Commerce be drawn to the reasonableness of this request, that the date on which the standard is arrived at should be distinctly earlier than it is at present the practice." The Secretary was instructed to point out, when transmitting the resolution, that when the present year's standard was fixed practically the whole of the wheat of the State had been delivered.

*Sheep and Wool Expert.*—Mr. W. S. Kelly brought under the notice of the Board the necessity for the appointment of a sheep and wool expert, who could devote the whole of his time to help build up the sheep and wool industry among the farmers. He referred to the good work that was done by the Wool Instructor of the School of Mines (Mr. A. H. Codrington), but the importance of the industry warranted the appointment of a man who could devote the whole of his time to educating the farmers along the right lines regarding the care of their flocks and the get-up of the clips. The Secretary was instructed to send on a recommendation for the appointment of a sheep and wool expert to the Minister.

*Date of Next Meeting.*—Wednesday, March 1st, was the date selected for the next monthly meeting of the Board.

*New Branch.*—Approval was given for the formation of a Branch at Second Valley, with the following gentlemen as foundation members:—C. Ness, A. Grundy, F. Putland, G. Cant, A. Bennett, E. Schmidt, G. Rephechange, J. Hamlyn, R. Mitchell, and L. Ness.

*New Members.*—The following names were added to the rolls of existing Branches:—Barmera—A. Cochrane, J. Dunn, W. F. Hubert, L. F. Andrews, L. P. White, H. J. Slaughter; Balhannah—H. J. Day, S. Bannister; Wirrega—G. Andrews, P. Baron, S. March; Berri—K. L. Ward; Loxton—R. F. Mayfield, R. E. Thiele, C. E. Thiele, jun., J. A. Thiele, H. Nitschke, J. Banisch, J. P. Sadlier, E. T. Pflaum; Weavers—J. D. Latty, W. F. Latty, P. Piggott, G. Brundell, G. Dodd, L. A. Slade, J. Sherriff; Block E—J. C. K. Brigham, A. J. Lamey, F. C. Birrill, D. Kidd, P. E. Muspratt, W. S. Ricketts, J. S. Blackburn, W. A. Giles, T. F. Spurling,

E. W. Williams, W. F. Gambie, O. Jungfer, A. W. Flaherty, G. Dunstan, W. B. Carr, H. Newstead, T. Charlwood, H. Lucas, C. R. Neighbour, L. R. C. Conway, J. W. Henneker, B. Weber, — Fisher, — Moule, F. H. Edmonds, — Kubank, A. R. Ninke, A. MacRae, C. F. Finnis, R. Mathison, A. G. Smith, J. H. Snook, V. A. Pool, A. H. Pitman, A. W. Lott, E. B. Tucker, L. Pitt, E. Pitt, sen., M. J. Gill, R. Long, T. Holcroft; Two Wells—F. W. Hosgood, H. P. Rowe; Collie—R. M. McKenzie; Monarto South—J. Frahn; Mount Bryan—A. P. Pledge, J. Connors; Maltee—K. A. Talbot, E. W. Wheaton; Milang—L. Walsh, H. Warner; Lone Pine—H. Roichter, J. Lierch, B. Eyre, A. E. Kleemann; Owen—T. L. Freebairn, D. J. Bruce, S. R. Hall, J. S. Lake, C. J. Lake; Lake Wangary—L. K. Fraser, S. G. Carriek, V. H. Wright, P. L. Farrelly, P. Puckridge; Tatiara—W. H. Hay, W. F. S. Hutley; Gawler River—H. L. Francis; Loxton—A. W. Traeger; Weavers—W. Croser, W. Mitchell, J. A. Bishop, H. Bishop, A. Cornish; Clare—R. Hague.

## **TERRITORY OF NEW GUINEA. VACANCY FOR DIRECTOR OF AGRICULTURE.**

Applications are invited for appointment as Director of Agriculture in the Territory of New Guinea, administered by the Commonwealth of Australia under mandate from the League of Nations.

The duties of the Director of Agriculture will be to advise on the agricultural development of New Guinea (both as to European-managed plantations and native gardens), to supervise scientific inquiries respecting plant diseases, soils, &c., and to control and manage, under the Administrator, the Agricultural Department of the Territory.

Applicants must have had a thorough training in the sciences underlying agriculture (honors degree preferred) and some experience of tropical agriculture (coconuts preferred). Age under 40 desirable.

The appointment will be in the first instance for five years, with opportunity of renewal if services are satisfactory.

The salary will be not less than £1,000 per annum. Applicants should state the salary they require. There is no provision at present for pensions; but the successful candidate will enjoy any pension benefits applicable to the post which may hereafter be conferred.

First-class passage to Rabaul *via* Australia for appointee and family (not exceeding three adult fares) will be provided; and return passages if the appointee vacates his post at the end of five years.

Three months' leave will be granted in each two years of service.

Applications should be addressed to the SECRETARY, PRIME MINISTER'S DEPARTMENT, MELBOURNE, and should reach him not later than the 31st March, 1922.

## THE AGRICULTURAL OUTLOOK.

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*Booborowie.*—Weather—The first part of the month was extremely hot, and towards the end cool weather predominated; 109 points of rain was registered. The lucerne fields are now looking a good green, healthy color. Natural feed is abundant in most instances. Stock—All in good, healthy condition. Pests—Rabbits are numerous in some places. Miscellaneous—Some farmers have commenced ploughing since the recent rain.

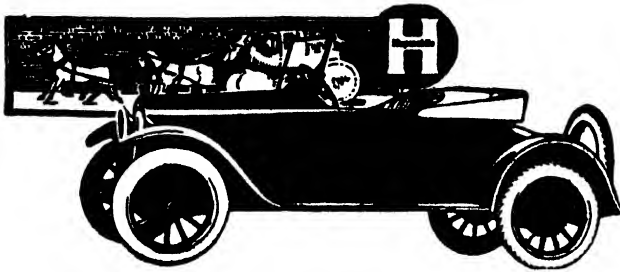
### CULTIVATION PRACTICES.

“Some of my fallow is rough and lumpy; what is the best way to get a reasonably good seed bed on this land?” This query, submitted by a farmer in the Pinnaroo district, was replied to by the Superintendent of Experimental Work (Mr. W. J. Spafford) as follows:—It does not necessarily follow that because fallow land is lumpy on the surface, it is loose underneath; and, as a matter of fact, the reverse very often applies; but trouble is generally experienced with such fallow by cultivating it deeply in the autumn, owing to the difficulty of making a good-looking job without putting the implements some inches below the surface. The correct way to treat such land is to break the clods with a roller, then only cultivate the immediate surface, making approximately 2in. the maximum depth.

Questioned as to whether it is advisable to roll, when the soil is “dry,” Mr. Spafford said:—It is quite all right to roll the land when dry, remembering that a rolled surface should never be left more than a few days, but a cultivator of some kind (rigid-tyne, spring-tooth, disc, or harrows) should be run over the land soon after the roller, whether the land is moist or dry.

“I grow oats after wheat on the stubble,” the correspondent added. “Is it advisable to burn the oat stubble, or is it as effective to graze these stubbles?” To which Mr. Spafford replied:—Where “take-all” has been at all plentiful on any block of land, all stubbles should be burnt, until the disease is checked, unless the block is being left out as pasture. If you are cropping the field as fallow—wheat—oats—fallow—wheat—oats, &c., it is quite wise and almost essential to burn the oat stubble as well as that of the wheat crop, to enable you to produce a good seed-bed on the fallow. If the block was worked as fallow—wheat—oats—pasture—fallow—wheat, &c., the same necessity of burning the oat stubble does not exist.

Summed up, the control of “take-all” in new districts is made possible by adhering to the following practices:—(a) Burning all stubbles; (b) alternating wheat crops with oats; (c) very shallow cultivating, including the ploughing; (d) heavy dressings of fertilisers.



# THE COMFORT CAR

**Stands  
Highest  
in  
Public  
Favor.**

Comfort in the Hupmobile is a very positive quality. It can be measured in the car's extraordinary riding ease, its superb steadiness over all roads, in its pulling power, and its wonderful performance.

ALL INFORMATION FROM

**Phoenix Motor Coy., Limited,**

SOLE AGENTS,

112-120, PIRIE STREET, ADELAIDE.

# HUPMOBILE

## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on March 1st, 1922:—

**BUTTER.**—During the month of February several hot spells were experienced, which not only affected the quality of many consignments of both cream and butter, but also affected the demand. Supplies of choicest grades are becoming scarcer, and importations are coming along from the eastern States to fill local trade wants. On the other hand, there is a big proportion of second grades which is unsaleable, and same is being placed in cold store for shipment to London on consignment. Values during the month showed slight fluctuations, first grade to choicest factory and creamery in bulk, 1s. 2d. to 1s. 2½d.; second grades, 8d.; best private separators and dairies, 11½d. to 12½d.; fair quality, 9d. to 10d.; well-flavoured store and collectors', 8d. to 9d.; off-conditioned lots slow of sale at 6d. to 7d.

**EGGS.**—Owing to usual shrinkage in supplies, values have firmed by 2d. per dozen. Demand, both for local and export, has been exceptionally good, and nice clearances have been effected. At close of the month fresh hen sold at 1s. 2d.; duck, 1s. 2½d.

**CHEESE.**—South-Eastern factories continue to consign very large quantities. Export and local trade has been brisk, so that stocks have not accumulated. Values continue stationary, range being from 6d. to 7d. for large to loaf.

**HONEY.**—Purchasers are operating freely for new take on prime quality, all consignments meeting with speedy quittance. Prime clear extracted liquid form, 4d.; second grades slow of sale at 2d. to 2½d.; beeswax saleable at 1s. 8d. for clear samples.

**ALMONDS.**—Consignments are coming forward more freely in this line, and samples of the new crop are opening out satisfactorily. Buyers continue to take up all offering, so that market kept nicely cleared, Brandis selling 1s.; mixed soft-shells, 11d. to 11½d.; hardshells, 5½d.; kernels, 2s. to 2s. 1d.

**BACON.**—Supplies coming forward during month have been quite equal to trade requirements, but owing to the lowering in price of the live animal bacon values are a shade easier. Best factory-cured sides, 1s. 1½d. to 1s. 2d.; middles, 1s. 3½d. to 1s. 4d.; hams, 1s. 5d.; lard in bulk, 7½d.; packets, 8d.

**LIVE POULTRY.**—Supplies have kept up remarkably well during the month, and it is pleasing to report that demand has been excellent. Three weekly auctions (Tuesdays, Thursdays, and Fridays) have been well attended by the trade, and good clearances have been effected at very satisfactory prices to consignors. Prices at end of month were:—Prime roosters, 5s. 6d. to 6s. 6d.; nice conditioned cockerels, 4s. to 5s.; light cockerels, 2s. 6d. to 3s. 6d.; piump hens, 3s. 6d. to 4s. 9d.; medium and light hens, 2s. to 3s.; ducks, 2s. 6d. to 5s. 9d.; ducklings, lower; geese, 4s. 6d. to 6s.; turkeys, prime conditioned, 1s. 6d. to 2s. 1½d. per lb. live weight; fair conditioned, 1s. to 1s. 3d. per lb. live weight; fattening sorts, lower; pigeons, 6d.

**POTATOES.**—Until towards the end of the month there was very little alteration to report in potatoes, but stocks at moment are somewhat bare of the white-skinned variety, owing to local supplies having cut off, and the rains in the Gippsland district of Victoria preventing digging, hence importations from there were held up. Market for Carmens has, as a result, firmed, but Gambier Pinkeyes are without alteration. At close of period rates were:—Pinkeyes, Gambiers, £6 to £7 per ton on trucks Mile End, £3 7s. 6d. on trucks Gambier (truck loads); Victorian and local Carmens, £9 to £10 per ton, Mile End.

**ONIONS.**—These also have firmed a little, quotations at moment being 8s. to 9s. for local onions; Gambiers not yet marketing.

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of February 1922, also the average precipitation to the end of February, and the average annual rainfall.

Station.	For Feb., 1922.	To end Feb., 1922.	Average to end Feb., 1922.	Average Annual Rainfall	Station.	For Feb., 1922.	To end Feb., 1922.	Average to end Feb., 1922.	Average Annual Rainfall
FAR NORTH AND UPPER WORTH.					LOWER NORTH—continued.				
Oodnadatta.....	1.25	1.20	1.38	4.83	Spalding.....	0.25	1.35	1.17	20.33
Marree.....	0.54	0.92	0.96	6.10	Gulnare.....	0.08	1.46	1.19	19.23
Farina.....	0.15	0.73	1.14	6.73	Yaaka.....	0.08	0.93	1.02	15.34
Copley.....	0.06	0.74	1.20	8.45	Koolunga.....	0.04	1.01	1.17	15.79
Beltana.....	0.03	0.77	1.45	9.01	Snowtown.....	0.22	1.27	1.03	15.95
Blinman.....	0.06	1.11	1.76	12.62	Brinkworth.....	0.05	0.75	0.98	16.16
Tarcoola.....	—	0.37	0.93	7.59	Blyth.....	0.23	1.14	1.21	16.75
Hookina.....	—	0.66	1.07	13.30	Clare.....	0.19	1.85	1.60	24.51
Hawker.....	—	0.62	1.12	12.72	Mintaro.....	0.21	1.77	1.23	23.26
Wilson.....	0.04	0.73	1.24	12.33	Watervale.....	0.38	2.51	1.57	27.41
Gordon.....	—	0.66	1.22	11.05	Auburn.....	0.44	2.32	1.74	24.25
Quorn.....	—	0.69	1.19	14.00	Hoyleton.....	0.19	1.53	1.23	17.79
Port Augusta.....	0.11	0.66	1.00	9.54	Balaklava.....	0.14	0.99	1.20	15.87
Port Augusta West	0.09	0.60	0.88	9.53	Port Wakefield...	0.30	1.09	1.16	13.19
Bruce.....	—	0.47	1.02	10.40	Terowie.....	1.29	2.21	1.48	13.67
Hammond.....	0.01	0.65	1.21	11.61	Yarowie.....	1.74	2.72	1.35	14.06
Wilmington.....	—	0.87	1.36	18.17	Hallett.....	0.45	1.34	1.27	16.37
Willowie.....	—	0.48	1.07	12.16	Mount Bryan.....	0.03	1.06	1.14	16.54
Melrose.....	0.09	1.34	2.05	23.21	Burra.....	0.17	1.10	1.39	17.96
Booleroo Centre...	0.03	0.83	1.35	15.53	Farrell's Flat.....	0.09	0.09	1.33	18.90
Port Germein.....	0.13	0.76	1.05	12.79					
Wirrabara.....	0.02	0.70	1.28	19.62	WEST OF MURRAY RANGE.				
Appila.....	0.02	0.65	1.28	14.98	Manoora.....	0.14	1.16	1.07	18.63
Cradock.....	—	0.63	1.20	11.18	Saddleworth.....	0.38	1.59	1.40	19.70
Carrieton.....	0.12	0.91	1.32	12.63	Marrabel.....	0.38	1.58	1.22	19.55
Johnburg.....	0.05	0.66	1.07	10.50	Riverton.....	0.30	1.38	1.37	20.66
Eurelia.....	0.15	0.91	1.35	13.36	Tarlee.....	0.15	1.09	1.36	17.75
Orroroo.....	0.04	1.07	1.61	13.57	Stockport.....	0.16	1.19	1.22	16.34
Nackara.....	0.60	1.27	1.29	11.33	Hamley Bridge...	0.07	1.39	1.31	16.45
Black Rock.....	0.07	0.80	1.28	12.51	Kapunda.....	0.31	1.37	1.50	19.80
Ucolta.....	—	0.74	1.43	11.90	Freeling.....	0.13	1.43	1.30	17.82
Peterborough.....	—	0.82	1.43	13.43	Greenock.....	0.20	1.75	1.38	21.56
Yongala.....	0.20	0.85	1.34	14.41	Truro.....	0.33	1.29	1.34	20.07
					Stockwell.....	0.28	1.34	1.36	20.24
LOWER NORTH-EAST.					Nuriootpa.....	0.30	1.87	1.36	20.94
Yunta.....	0.26	0.53	1.31	8.75	Angaston.....	0.31	2.36	1.40	22.44
Waukaranga.....	—	0.29	1.01	8.41	Tanunda.....	0.16	2.38	1.46	22.17
Mannahill.....	0.24	0.64	1.25	8.54	Lyndoch.....	0.10	1.95	1.33	22.81
Cockburn.....	0.62	0.84	1.26	8.22	Williamstown.....	0.15	2.26	1.50	27.52
Broken Hill, N.S.W.	0.65	0.87	1.56	9.91					
LOWER NORTH.					ADELAIDE PLAINS.				
Port Pirie.....	0.27	0.43	1.04	13.36	Mallala.....	0.05	1.17	1.26	16.66
Port Broughton...	0.23	0.82	1.05	14.18	Roseworthy.....	0.14	1.24	1.24	17.27
Bute.....	0.25	1.14	1.03	15.65	Gawler.....	0.08	1.20	1.37	19.08
Laura.....	0.03	1.46	1.31	18.16	Two Wells.....	—	1.14	1.18	15.85
Caltowie.....	0.23	1.48	1.31	17.07	Virginia.....	0.03	1.44	1.24	17.32
Jamestown.....	0.14	1.34	1.24	17.74	Smithfield.....	—	1.06	1.15	17.15
Bundaleer W. Wks.	0.03	1.18	1.16	17.89	Salisbury.....	—	1.49	1.33	18.40
Gladstone.....	0.06	1.47	1.18	16.13	North Adelaide...	0.01	3.61	1.35	22.09
Crystal Brook.....	0.20	1.70	1.20	15.74	Adelaide.....	0.05	2.27	1.35	21.03
Georgetown.....	0.21	1.78	1.31	18.44	Glenelg.....	0.04	1.86	1.20	18.37
Narridy.....	0.12	0.89	1.10	16.41	Brighton.....	0.05	1.51	1.38	21.24
Redhill.....	0.16	1.02	1.09	16.75	Mitcham.....	0.03	3.60	1.40	23.92
					Glen Osmond.....	0.02	2.85	1.56	25.74
					Magill.....	0.01	3.16	1.53	25.27

## RAINFALL—continued.

Station.	For Feb., 1922.	To end Feb., 1922.	A'g'e. to end Feb., 1922.	A'g'e. Annual Rainfall
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## MOUNT LOFTY RANGES.

Teatree Gully .....	0-11	3-03	1-57	27-77
Stirling West .....	0-17	6-95	2-47	46-62
Uraidla .....	0-14	6-67	2-21	44-06
Clarendon .....	0-13	4-82	1-87	32-98
Morphett Vale .....	0-05	2-04	1-42	22-76
Noarlunga .....	—	1-34	1-23	20-27
Willunga .....	0-13	4-44	1-47	25-87
Aldinga .....	0-19	3-10	1-16	20-24
Myponga .....	0-35	2-76	1-73	28-44
Normanville .....	0-11	2-50	1-16	20-51
Yankalilla .....	0-06	3-42	1-21	22-99
Mount Pleasant .....	0-22	3-25	1-51	27-04
Birdwood .....	0-14	2-73	1-69	20-26
Gumeracha .....	0-12	3-51	1-80	33-25
Millbrook Reservoir .....	0-03	3-74	—	—
Tweedvale .....	0-19	4-20	1-74	35-54
Woodside .....	0-21	4-80	1-77	32-08
Ambleside .....	0-08	5-58	1-76	34-62
Nairne .....	—	3-02	1-79	28-43
Mount Barker .....	0-37	4-92	1-88	31-13
Echunga .....	0-04	4-18	1-82	32-91
Macleodfield .....	0-16	3-66	1-64	30-53
Meadows .....	0-22	5-18	1-82	36-04
Strathalbyn .....	0-28	1-94	1-38	19-26

## MURRAY FLATS AND VALLEY.

Meningie .....	0-08	1-12	1-21	18-66
Milang .....	0-16	1-38	1-19	15-42
Langhorne's Bridge .....	0-22	1-56	0-98	14-55
Wellington .....	—	0-97	1-25	14-68
Tallem Bend .....	0-18	0-82	1-07	14-11
Murray Bridge .....	0-05	0-61	1-09	13-83
Callington .....	0-02	1-01	1-26	15-37
Mannum .....	0-12	0-54	0-95	11-52
Palmer .....	0-16	0-94	1-04	15-24
Sedan .....	0-21	0-48	1-03	12-13
Swan Reach .....	0-04	0-34	1-02	10-82
Blanchetown .....	—	0-09	1-06	10-16
Eudunda .....	0-04	0-69	1-23	17-50
Sutherlands .....	0-07	0-16	0-80	10-92
Morgan .....	0-07	0-43	0-99	9-18
Waikerie .....	—	0-34	1-13	9-68
Overland Corner .....	—	0-26	1-11	11-08
Loxton .....	0-14	1-01	1-54	12-58
Renmark .....	0-31	0-82	1-15	11-02

## WEST OF SPENCER'S GULF.

Eucla .....	0-11	0-69	1-23	10-02
White Well .....	0-71	1-07	0-96	9-10
Fowler's Bay .....	0-12	0-62	0-88	12-19
Penong .....	—	0-58	1-12	12-25
Murat Bay .....	—	—	0-82	10-32
Smoky Bay .....	—	0-41	0-79	10-92
Petina .....	0-01	1-11	0-83	13-05
Streaky Bay .....	—	0-60	0-91	15-11
Talia .....	—	0-94	0-58	15-38
Port Elliston .....	—	0-74	0-82	16-53
Cammina .....	—	0-95	—	11-52

## WEST OF SPENCER'S GULF—continued.

Port Lincoln .....	0-05	1-15	1-05	19-75
Tumby .....	0-13	0-76	0-65	14-62
Carrow .....	0-05	0-29	1-07	14-64
Arno Bay .....	0-06	0-87	0-88	13-08
Cowell .....	0-25	0-42	0-88	11-52
Minnipa .....	0-10	1-04	—	—

## YORKE PENINSULA.

Walleroo .....	0-06	0-47	0-97	14-09
Kadina .....	0-08	0-79	0-91	15-93
Moonta .....	0-01	0-63	0-95	15-25
Green's Plains .....	0-18	1-12	0-87	15-72
Maitland .....	0-09	2-24	1-09	20-05
Ardrossan .....	0-03	1-25	0-90	13-95
Port Victoria .....	0-08	1-25	0-88	15-35
Curramulka .....	0-04	2-12	1-02	18-16
Minlaton .....	0-12	2-32	0-92	17-79
Brentwood .....	—	1-82	0-74	15-64
Stansbury .....	0-44	2-63	1-01	16-96
Warooka .....	—	2-01	0-93	17-69
Yorketown .....	0-07	1-45	0-90	17-22
Edithburgh .....	0-09	1-71	0-96	16-53

## SOUTH AND SOUTH-EAST.

Cape Borda .....	0-08	1-03	1-16	25-01
Kingscote .....	0-11	1-44	0-96	19-01
Penneshaw .....	0-10	1-17	1-37	18-97
Victor Harbor .....	0-09	1-81	1-43	21-43
Port Elliot .....	0-08	1-53	1-33	20-00
Goolwa .....	0-11	0-87	1-29	17-83
Meribah .....	0-21	0-63	—	—
Mindarie .....	—	0-31	—	—
Karoonda .....	0-09	0-81	—	—
Pinnaroo .....	—	0-55	1-41	15-32
Parilla .....	0-26	1-08	0-95	14-39
Lameroo .....	0-17	1-49	1-16	16-27
Parrakie .....	0-22	0-84	0-94	14-27
Geranium .....	0-15	0-67	0-95	15-96
Peake .....	0-06	0-56	1-14	15-91
Cooke's Plains .....	0-23	0-81	0-97	14-84
Coomandook .....	0-09	0-98	0-98	17-31
Coonalpyn .....	—	0-41	1-18	17-44
Tintinara .....	0-27	0-61	1-09	18-54
Keith .....	0-81	1-09	1-22	18-19
Bordertown .....	0-42	0-97	1-37	19-44
Wolseley .....	0-30	0-83	1-14	18-06
Frances .....	1-24	1-95	1-27	19-78
Naracoorte .....	0-05	0-94	1-46	22-46
Penola .....	0-04	0-47	1-83	26-36
Lucindale .....	0-04	1-02	1-27	22-91
Kingston .....	0-06	2-09	1-34	24-44
Robe .....	0-27	2-59	1-44	24-58
Beachport .....	0-23	2-47	1-72	27-27
Millicent .....	0-41	2-08	1-98	29-37
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## AGRICULTURAL BUREAU REPORTS.

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Amyton .....	*	—	—	Frances .....	*	25	29
Angaston .....	*	—	—	Freeling .....	*	—	—
Appila-Yarrowie .....	*	—	—	Gawler River .....	739	13	10
Arthurton .....	*	—	—	Georgetown .....	*	11	8
Ashbourne .....	753	—	—	Geranium .....	*	25	29
Balaklava .....	733	11	8	Gladstone .....	†	11	8
Balhannah .....	753	10	7	Glencoe .....	*	—	—
Baramba .....	743, 747	7	11	Glossop .....	*	1	—
Beetaloo Valley .....	725	8	12	Gorke .....	*	15	12
Belalie North .....	*	11	11	Green Patch .....	743	13	10
Berri .....	†	15	12	Gumeracha .....	*	13	10
Big Swamp .....	*	—	—	Halidon .....	*	—	—
Blackheath .....	753	11	8	Hartley .....	753	—	—
Black Springs .....	753	14	11	Hawker .....	*	14	11
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Booleroo Centre .....	729	10	7	Ironbank .....	*	11	8
Borrika .....	*	—	—	Julia .....	*	—	—
Bowhill .....	*	—	—	Kadina .....	*	—	—
Brentwood .....	*	9	6	Kalangadoo .....	*	11	8
Brinkley .....	†	11	8	Kanmantoo .....	*	11	8
Bundaleer Springs ..	*	—	—	Keith .....	*	—	—
Burra .....	*	—	—	Ki Ki .....	*	—	—
Bute .....	*	7	—	Kilkerran .....	†	9	6
Butler .....	*	13	10	Kimba .....	*	—	—
Caell .....	*	—	—	Kingseote .....	*	—	—
Caltowie .....	*	—	—	Kingston-on-Murray ..	747	—	—
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Clanfield .....	*	—	—	Kybybolite .....	754	9	6
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Clarendon .....	*	13	10	Lameroo .....	*	—	—
Claypan Bore .....	*	15	12	Laura .....	732	10	8
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Coonawarra .....	*	—	—	Loxton .....	*	—	—
Coorabie .....	741	—	—	Lucindale .....	*	—	—
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Meribah .....	*	8	12	Riverton .....	*	—	—
Milang .....	751	11	8	Riverton (Women's) ..	*	—	—
Millicent .....	753	4	1	Roberts and Verran ..	741	9	6
Miltalie .....	743	11	8	Rockwood .....	752	13	10
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Minlaton .....	*	10	7	Rosy Pine .....	*	—	—
Minnipa .....	*	8	12	Saddleworth .....	*	—	—
Mintaro .....	*	11	8	Saddleworth (Women's)	*	—	—
Mona to South .....	*	11	8	Salisbury .....	†	7	4
Moonta .....	*	10	7	Salt Creek .....	†	—	—
Moorak .....	756	9	6	Sandalwood .....	*	—	—
Moorlands .....	*	—	—	Shoal Bay .....	*	—	—
Moorook .....	*	—	—	Smoky Bay .....	*	—	—
Morchard .....	723	11	8	Spalding .....	*	—	—
Moruan .....	*	—	—	Stockport .....	739	—	—
Morphett Vale .....	753	9	13	Stathalbyn .....	*	7	11
Mount Barker .....	*	8	12	Talia .....	*	13	10
Mount Bryan .....	732	—	—	Tantanoola .....	*	11	8
Mount Byran East ..	*	—	—	Taplan .....	*	18	—
Mount Compass .....	*	—	—	Tarcowie .....	†	7	11
Mount Gambier .....	757	11	8	Tatiara .....	†	18	—
Mount Hope .....	*	11	8	Two Wells .....	737	—	—
Mount Pleasant .....	751	—	—	Uraidla & Summertown	*	6	3
Mount Remarkable ..	*	—	—	Veitch .....	*	—	—
Mundalla .....	*	8	12	Virginia .....	†	—	—
Murray Bridge .....	*	—	—	Waikerie .....	*	—	—
Myponga .....	*	8	12	Wall .....	*	—	—
Myponga .....	*	—	—	Wanbi .....	*	—	—
Nantawarra .....	*	9	6	Wareowie .....	*	—	—
Naracoorte .....	*	—	—	Watervale .....	*	—	—
Narridy .....	†	12	9	Weavers .....	740	13	10
Narrung .....	*	11	8	White-Yarcowie .....	731	—	—
Neeta .....	*	—	—	Wilkawatt .....	†	11	—
Netherton .....	†	—	—	Williamstown .....	738-9	1	6
North Booborowie ..	*	—	—	(Women's)	739	10	7
North Bundaleer .....	*	—	—	Williamstown .....	*	8	12
Northfield .....	*	8	12	Wilmington .....	723	8	12
Nunkei and Yurgo ..	*	5	2	Windsor .....	738	—	—
O'Loughlin .....	*	8	12	Winkie .....	*	13	10
Orroroo .....	*	—	—	Wirrabara .....	731	—	—
Owen .....	736	17	14	Wirrega .....	*	—	—
Parilla .....	*	—	—	Wolowa .....	*	—	—
Parilla Well .....	*	13	10	Wudinna .....	*	—	—
Parrakie .....	*	—	—	Wynarka .....	*	—	—
Paruna .....	*	—	—	Yabmana .....	*	—	—
Paskeville .....	†	7	11	Yacka .....	*	7	11
Penola .....	*	4	1	Yadnarie .....	†	7	11
Petina .....	*	25	29	Yallunda .....	*	—	—
Pinnaroo .....	*	10	—	Yanmoo .....	*	—	—
Pompoota .....	*	—	—	Yeelanna .....	†	11	8
Port Broughton .....	*	10	7	Yongala Vale .....	*	—	—
Port Elliot .....	*	11	8	Yorketown .....	*	—	—
Port Germein .....	*	18	8	Younghusband .....	*	16	13
Ramco .....	747	15	10				
Redhill .....	732	14	18				

\* No report received during the month of February.

† Held over until next month.

‡ Formal meeting.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

##### (PETERBOROUGH AND NORTHWARD.)

###### HOOKINA (Average annual rainfall, 12in.).

January 12th.—Present: seven members and four visitors.

**THE FARM MEAT SUPPLY.**—Mr. B. Murphy contributed a paper in which he said every farmer should keep a few head of sheep and pigs for rations. In some districts, by the co-operation of four or five farmers, a bullock could be killed and delivered by each farmer in turn. Pigs should be killed during the cold weather, and the hams boned and placed in a pickle for about 12 days, when they could be dried. Beef could be cured easily, providing it was not killed during thundery weather. It should be cured, preferably, in pickle, because it became very dry in salt. Mutton was also very easy to pickle, but in the hot weather he would remove all the fat from a prime sheep, and dry salt the carcass. If the meat was left out to cool on a wire-netting frame the second or third night after salting, there should be no further trouble. Any meat that had to be salted during the summer weather should be attended to before sunrise. A good discussion followed the reading of the paper. Mr. H. V. Heneschke said that during the hot weather a beast should be yarded for at least five hours before slaughtering. Mr. F. Cagney thought that beef, when dry salted, did not require so much salt as when pickled. Other members were of the opinion that the flavor of hams and bacon could be improved by smoking.

###### WILMINGTON (Average annual rainfall, 18.26in.).

January 18th.—Present: 11 members.

**CARE OF HARNESS.**—Mr. G. A. Stephens contributed a short paper on this subject. Every farmer or grazier, he said, should give all the leather work on the harness the best of care. The collars and hames should be hung on a peg, with the lining towards the post; the winkers could also be hung on the same peg. If placing two collars on the same peg, the first pair of winkers should be turned with the face inwards, to prevent the eye flaps from spreading. He did not approve of hanging collars over a rail, because the continual stretching of the throat would weaken the pipe. The collars, winkers, wagon saddles, spiders, and reins should have a good coat of the following mixture:—Beef or mutton fat melted in a tin and an equal proportion of neatsfoot oil poured in whilst hot. The mixture should be applied to the leather whilst warm. During the discussion which followed, Messrs. Scott and George mentioned that leather harness should be oiled frequently, and not allowed to become dry and hard. The use of boiled linseed oil was recommended for the seats of saddles, and fat or suet for all other leather. Mr. Schuppan recommended the use of lard for leatherwork. He had in his possession collars that had been in use for over 30 years, and they were still sound, which fact he attributed to frequent oiling and ordinary care.

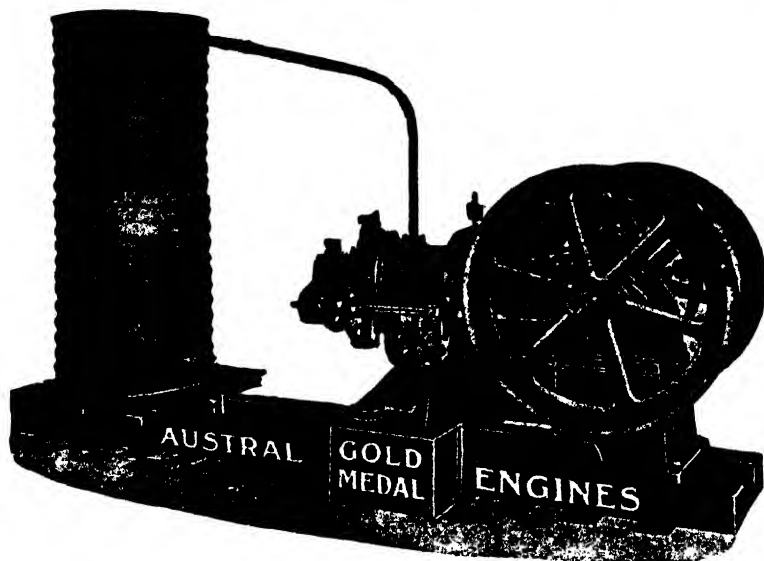
**MORCHARD, February 16th.**—The meeting took the form of a "Question Box," when several subjects of interest to agriculturists were brought forward for discussion.

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## MIDDLE-NORTH DISTRICT.

## (PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 23.50in.).

February 8th.—Present: 17 members and two visitors.

**PIG RAISING AND BACON CURING.**—Mr. A. H. Clogg, who contributed a paper on this subject, said the site chosen for the pigsties should be one that would allow of free drainage from the enclosures. Clean and dry bedding should be provided for each sty. The speaker favored iron roofs in order that no harbor would be provided for vermin. The pigs should be allowed the run of a small paddock close to the sties, for he believed that exercise played an important part in the health of the animals. If a small straw stack was placed in the yard, the sow would make her own bed for farrowing. He favored that plan in preference to allowing the sow to farrow in the sty. Of the many breeds kept by farmers he was in favor of the Berkshire, and for a bacon pig suggested a cross with the Tamworth. All grain should be crushed before being fed to the animals, and with plenty of fresh, clean water and a liberal supply of charcoal no sickness should be contracted by the pigs. Speaking of the curing of the pig, Mr. Clogg said the animal should be tied up for 12 hours prior to killing, and, when sticking, care taken to see that all the blood was drained from the carcass. If the latter point was not carefully observed, the curing would not be very successful. The carcass should then be hung up in a cool place for 12 hours before being cut up into pieces. For making the brine he recommended 10lbs. of salt,  $\frac{1}{2}$ lb. of saltpetre, and 2lbs. of brown sugar, in sufficient water to cover the pig in the pickling tub. The brine could be said to be of the right strength when an egg or potato would float in the solution. The meat should be turned every day for the first week, and then every two or three days until cured. For a pig weighing 140lbs. to 150lbs. the sides required about 14 days in the brine, and the hams about three weeks. After hanging for 48 hours the sides could be rolled and the hams hung up in strong calico bags.

## BLOCK E.

February 7th.—Present: 31 members.

**TREATMENT OF YOUNG VINES.**—The following paper was read by Mr. G. R. Kubank:—The most essential factor in the treatment of young vines the first year after planting is the use of the prong hoe, the cultivator, and disc. So soon as the vines have been planted and irrigated, and the ground is fit for cultivation, it should be worked up with the cultivator and afterwards with the disc, if possible. When this has been done, all the vines should be hoed, and the crust around them thoroughly broken with a prong hoe. If this is not done, the ground will crack and allow the air to penetrate to the roots; it will also, in heavy soil, especially after flooding, allow the earth to bake on to the stem and so prevent the sap from flowing freely. In consequence, the vine will become stunted, and if it does weather the first hot wind, it will not make the growth it would have if given a good start. Young vines should, if possible, be hoed after every irrigation or heavy rain the first year after planting. **Irrigating.**—In heavy soil it is not advisable to flood young vines. They should be thoroughly soaked by the water being run down furrows fairly close to them. On a block where there is a big fall, a mere trickle is sufficient, but if there is any difficulty in getting the ground to soak, all the furrows should be dammed at intervals, starting at the lowest end of the block. This should not be necessary, though, if the land has been treated with gypsum. Gypsum should in all cases be applied freely, a dressing of 5cwt. to the acre is not too much. It should, however, be scattered evenly, and not thrown around a young vine in shovelful. When furrowing out for water, the operator should use a little discretion on blocks that have not been very well graded or have been, perhaps, left uneven with the disc. A little foresight sometimes, to dodge a mound or a bit of a hollow with the plough, will very often prevent a break halfway down the row, and so save the person who happens to be irrigating a trip wading ankle deep to mend it. After the block has been furrowed out, all connections should be made, head ditches thoroughly cleaned, and, where necessary, banks thrown up with the disc or shovel. When everything is in readiness, the water may be turned on, care being taken to see

that the flow is properly regulated. Any part on the block difficult to irrigate should always be done in daylight, if possible. Cultivation.—When cultivating a block the implement should in all cases be set well into the ground, the blocker should not go out in the morning with the intention of doing about 10 acres. If he only did five, and it was done thoroughly, it would pay better. Cross cultivating is a good idea, and saves much hand work in keeping down weeds, &c. Weeds should always be taken out by the roots; if not, they very often grew again. Cover Crops.—Cover crops, in my opinion, on land that is not actually sand, are a mistake. However, when the soil is inclined to drift, it is necessary to have a cover crop of some sort. The best cover crop is wheat or oats, sown about June. After the crop is cut in September or October, the stubble can be left to prevent any drift that may occur. To do this it would be necessary to put in the base pegs for planting. Cross cultivating is impossible with a cover crop. Of the summer crops, Sudan grass is, to quote Mr. Harry Taylor in a recent issue of the *Pioneer*, “an ungodly soil robber,” but it is also, when once established in a block, very hard to exterminate. Anyone who has a nice waving crop of Sudan grass this year will be sorry next year when ploughing his block. Another point in favor of the winter crop is that it grows for the most part while the vine is dormant. Suckering vines the first year is a mistake, and tends to check the root growth. A vine that is let go the first year must make more root growth than one that is continually suckered or cut about. Trellising.—The strength of the trellis lies in the strainer and the strut; the heavier the strainer and strut the more substantial the trellis. A strainer should not be less than 3ft. 6in. in the ground, and in all cases be well rammed. A small niche for the strut should be chopped in the strainer at a given height from the top, before erecting. By a niche I do not mean a gap halfway through the strainer. The small end of the strut should be shaped with the axe to fit the niche in the strainer. The base end of the strut should be let in the ground not less than 18in. After fitting the

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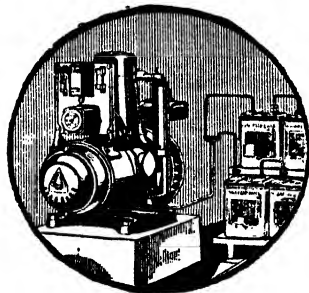
**CURRIE STREET, ADELAIDE.**

strut into position a good solid chock of wood should be driven behind the end let in the ground well into the subsoil. If the strut is not let deep into the ground, but close to the surface, it will be found that with the wires strained fairly tightly, after the ground becomes saturated with water, the pressure from the strainer will push the chock away and leave the strainer with a list towards the first vine. When erecting strainers it is a good idea to give them a very slight tilt away from the vines. By having a strainer midway in a 10-chain row a trellis will be considerably strengthened. When possible, No. 8 wire should be used. A simple method when starting a trellis is to run two guide lines of pegs for the cross lines by means of a tape along about the sixth row from each boundary. Great care should be exercised when taping these base lines so as to get the pegs exactly centre, and at the same time be at the correct intervals. When erecting these two guide lines a base peg should be pulled up, the crowbar driven in its place, and the hole marked out exactly and put down; the post should then be erected in the centre of the hole. If this operation is carried out carefully the rest of the trellising will be found easy, and the posts should line up each way. If the trellising is done early in the autumn, before the leaves have dropped, great care should be taken when sighting to get the posts dead centre along the row. Vines that are planted so that the prevailing winds strike the rows side on and make much growth, have a tendency to grow more the way the wind blows, with the result that if the centre is taken when sighting, it will be found, when the vines are pruned, that the trellis is perhaps 6in. out of plumb, and consequently all the stems will have a list. This, apart from being an eternal eyesore, is awkward for cultivation. If the base pegs, from the time of planting, could be left undisturbed, this could easily be avoided, but, somehow, these have a habit of getting knocked over, and are not always reliable.

**Pruning Vines the Second Year.**—When pruning vines the second year the best method is to cut through the third bud, and place a string, by means of a slip knot, over the top of the spur, and tie up to the wire; in the case of currants, to the top wire. After the vines have sprouted it will be found that in most cases each vine has thrown out about six young shoots. After these have been growing for two or three weeks, the straightest should be selected and given a few turns round the string. The young shoots not wanted should not be suckered until the one being used has reached the first wire. If they are broken off before, there will be a rush of sap to the one required, causing it to grow very rank and brittle, so that the least touch or wind will break it off. It will also shoot the buds very far apart, which will interfere with giving the vine a good shape. After the vine has been suckered, the cane being trained up will develop young shoots from the ground upwards. These should all be broken off below the two required for forming a T. In breaking off these young shoots, the leaves should be left, if possible, to protect the young stem against the sun and weather. A great deal of argument has cropped up as to whether the top or bottom arms in the case of currants should be made first. My experience is that, providing the vine is making vigorous growth, they can all be made at the same time. In the case of weak vines, the bottom arms should always be made first. As regards training currants on three wires. I do not favor this system, yet, at the same time, I do not profess to be an authority on the subject. However, I am inclined to think that it is possible to grow equally as heavy crops on two wires as on three, and at less expense and also less artificial manures. Besides, one needs a neck like a giraffe to pick the fruit from the top arms or prune them. As regards tying up young vines, a simple method is to have a ball of binder twine in a haversack slung over the shoulder, with the loose end always kept handy. If tying up is made a separate job, and the blocker has other work pending, and wants to get it over quickly, he may, by tucking the secateurs under one arm, tie the slip knot for placing over the next vine while walking from one vine to another. This, after a little practice, is quite easy, and if there are some thousands of vines to be done, saves much time.

**Pruning Vines the Third Year.**—No spurs should be left the third year when pruning for the first crop. Sultanias not included, everything should be cut to a base eye so as to force all base eyes and assure plenty of spurs for the next pruning in a good position, and close to the main arms. When the pruning has been completed, everything should be taken off the wires, and these strained up as tightly as the trellis will allow. When all the wires have been strained, the vines may all be twisted up to as good a shape as

possible, and tied where necessary. Well-shaped vines later on act as a kind of support to the trellis. Cincturing.—Currants that have made vigorous growth man be cinctured the third year with a single incision by means of an ordinary cutting knife, but great care should be taken not to cut into the wood, as that would be detrimental to the vine. One should not be afraid to give a vigorous vine plenty to do the third year. Hints that Might be of Use to the New Blocker. —Vines that are planted carefully, in the proper planting season, *c'est a dire*, not later than September 30th, well looked after and given a flying start, will weather all the elements without a cover crop. They will at the end of two years possibly be six months ahead of vines that have had a cover crop of Sudan grass. Vines trained on loose wires will sag immediately after the setting of the fruit, and, once they have sagged, currants, at any rate, they can never be got into shape again. A good lucerne patch should be the first consideration on a new block. This can be sown either in April or September. If sown in April, with a special irrigation, it is a good plan to sow a crop of wheat in with it, as a protection against the frost. In conclusion, I should like to emphasise this. It is easier to keep the wolf from the door by sticking to the block and coaxing the young vines to grow, than by going out to work and letting them shift for themselves.



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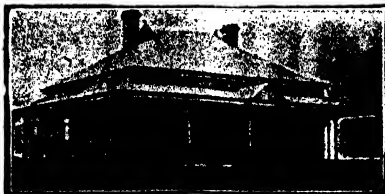
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**BOOLEROO CENTRE (Average annual rainfall, 15.83in.).**

February 10th.—Present: six members.

**REVIEW OF THE PAST SEASON.**—The Hon. Secretary (Mr. M. J. Carey), who contributed a paper on this subject, said during the harvest of 1920-21 several heavy falls of rain were received, which provoked a strong growth of summer weeds on the fallow. In the majority of cases labor was unobtainable, and the farmer did not have sufficient time to devote to the thorough working of the fallow, so that when seeding time arrived it was almost impossible to tell, except in a few instances, which paddocks had been ploughed. Generally speaking, an early start was made with seeding operations, but, owing to the very exceptionally wet weather, the work was not completed until very late in the year. On the whole, early sowing had undoubtedly given the best results during the past season. He had always urged the importance of sowing selected seed. He knew of cases during the past year of where farmers had devoted a good deal of time to their land, and were to be complimented on the excellent condition of their fallows, yet they had been guilty of sowing seed wheat which, if it had been carted into the stack, would have been docked for being below the standard quality. Referring to varieties, the speaker said Currawa had given him the best yields; both as regards grain and hay. Onas and Federation had the appearance of giving good returns, but the results in the bag were very disappointing. Newman's Early had been sown late, and as it matured about a fortnight earlier than Currawa, he considered it an excellent wheat to sow, in order that an early start could be made with harvesting operations. The hay cut during the past harvest was not rank in the straw, and it was his intention to give the horses two feeds of long hay per day. That should result in a considerable saving of labor. As Secretary of the Branch he mentioned that their Branch had not done a very successful year's work, and he urged those present to endeavor to impress on farmers the importance of the Bureau and the benefits that were to be derived from the organisation.

**BLYTH (Average annual rainfall, 16.46in.).**

February 4th.—Present: 15 members and four visitors.

**SHELTER TREES FOR THE FARM.**—In the course of a paper, "Which is the Most Suitable Shelter Tree for the Farm," Mr. J. S. McEwin said the planting of suitable trees around the homestead not only made the farm more attractive, but also enhanced its value. In the selection and planting of trees one had various conditions to take into consideration. These were as follows:—"(a) To select trees suitable to the soil; (b) to regulate the spacing of the trees to suit the object of planting, whether for timber or shelter; (c) to make all necessary preparations so as to have no delay in planting at the proper time; (d) to choose suitable weather for planting out, and to keep the trees protected." In referring to varieties, the speaker said almost any kind of tree could be procured from the Woods and Forest Department during the planting season. The best plan was to write for a catalogue of trees, which contained almost all the information necessary for the intending planter, besides a list of trees available, and conditions most suited to them. For the Blyth district he preferred the following trees:—Sugar gum, Aleppo pine, carob or locust tree, white cedar, white acacia, tamarisk, pepper tree, and the olive. The sugar gum grew easily and rapidly in most parts of the district, it made excellent shade, and was a good breakwind if not planted too closely. When grown for shelter, he would recommend planting not less than 20ft. apart, and anything up to 30ft. He had planted Aleppo pines, and they seemed to be doing very well, but he did not think it advisable to plant them on scrubland, as they required a good deal of water and nursing for the first year. The carob was a splendid breakwind, and was eminently suited for planting around a garden to protect fruit trees or flowers. It required careful attention and cultivation for the first two years, when it would make good progress. For the first 12 months it should be protected with bagging, to keep off frosts, and then allowed to gradually become acclimatised. The white cedar and white acacia were both deciduous, and were admirably suited for avenue purposes. Both varieties were hardy, and had a very pleasing appearance during the summer months. The tamarisk was also bare in winter, but looked very nice in summer when in flower.

It was a very hardy tree. The pepper was an excellent shady tree, but favored a sheltered spot, as it disliked wind. It should not be planted too closely to buildings or tanks. The olive, apart from being hardy, was a splendid breakwind and a profitable tree, as its fruit was of commercial value. The land on which the trees were to be planted should be broken up and fenced off. An effective guard for delicate trees could be made by inserting four stakes inside a half super bag, which, when cut in two and the bottom split, would do for two trees, and last long enough until the plant was strong enough to be exposed. One of the main points was to select cloudy and damp weather when planting. A much better percentage would result than if the trees were set out in sunny and windy weather.



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## WHYTE-YARCOWIE (Average annual rainfall, 13.91in.).

January 27th.—Present: nine members.

**HARVEST REPORTS.**—Mr. McCallum observed that the season was rather a disappointing one. It opened well, and the rainfall was above the average, yet this was not, for some reason, reflected in the crops. The wheat returning the best yield on his farm was Major, a variety which of late years had come into prominence. It was, however, grown under more favorable conditions than Federation, which he had found as a rule more than held its own. He suffered practically no loss from unseasonable harvest conditions. Leaf or flag smut was rather prominent on the hillsides in places. He noticed that wheat sown under dry or wet conditions was also affected. Mr. Robinson reported a rather unsatisfactory return. The dry period, with extreme heat, in the latter part of October and early November, followed by the locust plague, greatly reduced the subsequent yield. He, too, had found flag smut rather prevalent, and was inclined to attribute it to the dry conditions and extreme heat. The locusts caused considerable damage to the wheat, and took quite two-thirds of his oat crop. Mr. Green also reported a disappointing harvest. The farms on the eastern side of the district suffered greater damage from grasshoppers than other parts. Federation wheat returned the highest yield on his farm, followed closely by Major. Then came Onas; but hay wheats, Zealand Blue, &c., were almost a failure. The sample generally was first class; he used bluestone and a pickling machine, and was not troubled with smut. Mr. S. Hunt reported a fairly satisfactory crop. He fed off Onas, of which the stock seemed fond, but that variety did not respond well to that treatment. The yield was light and sample poor. He had decided to discard this variety in future as being unsuitable to the district. Major was satisfactory; Yandillah not so good. His Federation was put in late, and suffered through the dry and hot periods. Federation had proved rather subject to hant and flag smut. Mr. Walsh's crop started well, the early part of season being favorable. The extreme heat and grasshopper plague played havoc with it in November. In his case, Major seemed to suffer most, and he estimated his loss in this variety at fully one-third. He took the trouble to try and arrive at the probable loss caused by the locusts by counting the heads of wheat cut off and on the ground, and those left on the straw on a small area, with the result that he counted 140 heads on the ground and 110 on the straw. Notwithstanding that, his crop averaged 14bush. All members agreed in the opinion that locusts had not deposited eggs in the district during the invasion in November last. Some members noticed that the insects attacked the grain in the ear. That was considered unusual, as in some instances almost half the grain in a head was devoured.

## WIRABARA (Average annual rainfall, 18.91in.).

January 17th.—Present: 17 members.

**FELLING AND SPLITTING TIMBER.**—In the course of a short paper dealing with this subject, Mr. M. Peacock said when the tree was being felled it should be secured with an axe in order to prevent it from slipping off the stump. When felling a vertical tree, the saw cut should be opened with a wedge to take the weight of the saw and give the tree a chance to lift and fall. By knocking the tree with the back of the axe it was nearly always possible to tell whether the tree was of a solid, hollow, or pipe character, and if a vertical piece of bark was taken from the tree, and it split easily, it was safe to say that the tree contained good splitting timber. A tree growing on the side of a steep hill would usually fall downwards, even though it had a decided lean up the hill. After the tree had been cut down, it should be sawn into logs of the required length. The saw should be kept running free from bark, and if it was inclined to gum and pull heavily, the bark should be scraped from the teeth of the instrument and a few drops of water poured into the cut whilst the saw was in motion. The saw should not be weighted, but worked in a free and easy long stroke. When splitting the timber the wedges should not be placed too far apart, and it was a good plan to open up one end of the log before starting at the top. It was a mistake to force a wedge into the timber; if it refused duty, another wedge should be inserted further back to keep the log well open. It sometimes happened that a wedge kept jumping out of the log; but that obstacle could be overcome by using a piece of stone as a substitute for the wedge. For blasting, the speaker

suggested that a deep hole should be made in the log with a medium-sized auger, and the charge inserted and rammed into a firm bed. He preferred gelignite and powder to dynamite for blasting operations. Large wedges should not be used for splitting red gum, as that class of timber was very brittle, and was easily broken. An interesting discussion followed, in which Messrs. Curnow, Barbary, Jericho, and Stevens took part.

**MOUNT BRYAN, January 21st.**—Mr. E. Thomas read an article from the *Journal of Agriculture*, "Farm Sanitation," and an interesting discussion ensued. A discussion also took place on the subject, "Ailments of Horses."

**REDHILL, February 15th.**—The meeting took the form of a discussion on the subject "Observations and Reports of the Past Harvest."

**LAURA, January 27th.**—A discussion took place on the subject of green feed for dairy cattle. Mr. Bowker said that barley was good for stock, but at the close of the season better returns would be received if good hay was substituted for the green fodder. He thought Bathurst oats were good for green feed, because the crop could be fed off, and at the end of a year a good cut of hay could be obtained.



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**LOWER-NORTH DISTRICT.****(ADELAIDE TO FARRELL'S FLAT.)****BALAKLAVA** (Average annual rainfall, 16.03in.).

February 6th.—Present: six members and two visitors.

**AFFORESTATION.**—In a short paper on this subject, Mr. P. H. Roediger said everybody should realise the importance of afforestation, not only in securing a supply of firewood, but also to provide commercial timber, which was rapidly increasing in value. Landholders should recognise their duty to those who would come after them, and assist in increasing the national wealth. Trees added to the beauty of any country, and every farmer should do his utmost in the way of tree planting. While the sugar gum was one of the easiest trees that could be grown under local conditions, he did not regard the timber as being very useful either for commercial purposes or for firewood. The Forestry Department would give settlers any information desired regarding the right trees to plant. In the discussion that followed, Mr. Masters was of the opinion that the sugar gum was the tree best suited to local conditions. His recent visit to Western Australia had made him wonder at there being any shortage of timber in South Australia, but presumably the high freights were the cause of same. So far as their district was concerned, his opinion was that it was not suitable for a thorough afforestation scheme, either by the Government or private individuals. Mr. Spillane remarked that one had only to drive around the country to see at what a rapid rate the supply of timber was being exhausted. The native pine did well in some parts of the district, but when taken out and planted in the open did not thrive so well as when growing amongst natural shelter. Mr. Pritchard (late of South Africa) said he came from a country where there was practically no natural timber, but of late years both the red and the blue gum had been planted. The Afforestation Department had succeeded in getting trees planted along the sides of the railway line, and now travellers saw belts of trees instead of the barren wastes of former days. The Chairman (Mr. H. M. Tuck) said that when he first came to Balaklava he had been impressed with the place as being one where trees would grow, and as a councillor he and others had arranged for planting trees along some of the roads, with very satisfying results.

**BLACK SPRINGS.**

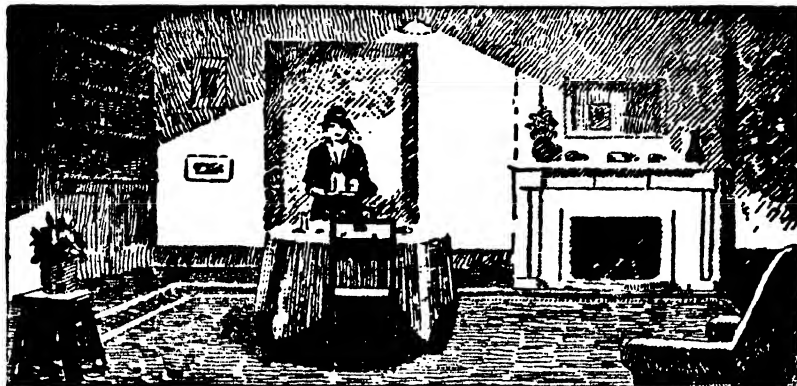
January 17th.—Present: 16 members and one visitor.

**FARM MANAGEMENT.**—Mr. A. Heinrich contributed a paper on this subject. Special attention, he said, should be paid to the farm stock, and an endeavor made to procure a good class of farm horse of the Clydesdale breed. All the horses should be of the same color, and should be kept in good condition. They should each be tied up in a separate stall, and watered before every meal, without their harness on, so that they could roll if they felt inclined. The horses should be groomed in the morning after they had been fed. The harness should be kept on separate pegs, when there would be no fear of it becoming mixed. The collars should be kept thoroughly clean, and the harness greased with a good oil or fat black twice a year. A few foals should be bred each year, which would allow of the disposal of some of the aged horses each year. Unless sufficient help was available, it would not be advisable to keep more than three or four pure-bred cows. The Merino was the best type of sheep for the farmer to keep. A few pigs and fowls were also a profitable proposition. In preparing the soil for the next season's crop, fallowing should be commenced as soon as seeding operations were completed, and an endeavor made to finalise the work by the end of August. It was most important to keep the fallow thoroughly cultivated up to the commencement of spring. If weeds still made an appearance, the sheep could be relied upon to keep them in check. The fallow should be harrowed after the rains that followed harvest, and the stones carted away. Special attention should be paid to draining the farm. A few small drains around the outside of a paddock would prevent a deep creek from forming through the centre. Seeding operations in that district should be commenced during May, about 80lbs. of wheat and 1cwt. of super being sown to the acre. The farmer should also take care of all sheds, implements, machinery, harness, &c., and keep all fences in good repair. A good discussion followed the reading of the paper.

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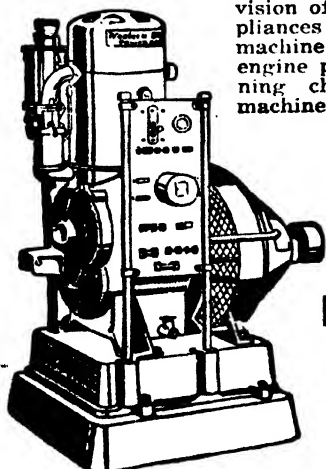
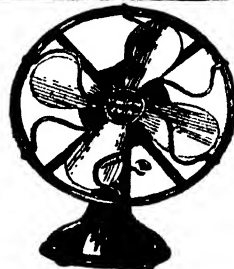
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## LONE PINE.

January 10th.—Present: 22 members and three visitors.

**FEEDING AND CARE OF ANIMALS.**—Mr. A. Fromm contributed the following paper:—The main point in the care of the horse is a well-ventilated and warm stable, with a separate stall for each horse. If the horses are tied up it will prevent them from kicking each other while feeding. The stalls should be well cleaned at least twice a week, and a good bedding of straw provided each night. Good chaff is essential, and horses should be fed three times a day with a little oats or other crushed grain added. A sheaf or more of short hay could be provided each night. In slack times it would be advisable and economical to mix a little cocky chaff with the wheaten or other chaff. The animals should be fed at regular intervals, and not overdriven during the day's work. Water should be handy to the stable, and all harness, particularly collars, should be well looked after to prevent sore shoulders. No horse should be turned out in the paddock or on to the road to look for its food immediately after a day's work in the team. In referring to the care of the cows, Mr. Fromm advised feeding chaff and bran or other crushed grain while the animals were being milked, and a little hay in the yard over night. A quantity of cocky chaff for feeding purposes during the cold weather, when there was no feed in the paddock, was necessary. For summer fodders, maize and sorghum sown at the end of September or beginning of October, so as to be ready to cut in January, were also recommended. Another important point was the careful observation of the animals, and, as a layman, one should not presume too far with the doctoring of stock, but call in the services of a veterinary surgeon. If at any time an animal did not eat all of its food, it could generally be accepted that the beast was not in the best of health, and care should be bestowed on it until its normal appetite was re-established. A lengthy discussion followed the reading of the paper. The ways and means of combating the locust pest were also discussed.

LYNDOCH (Average annual rainfall, 23.01in.).

January 12th.—Present: 15 members.

**WHEAT.**—In the course of a paper under this heading, Mr. H. V. Goerke first mentioned some of the many theories advanced by various writers regarding the origin of the wheat plant, and then traced the rise and progress of the wheat industry in Australia. Continuing, Mr. Goerke said that whilst the wheat growers of the present time had made great strides in the adoption of up-to-date machinery, improved methods of cultivation, soil fertilisation, and crop rotations, it was to be regretted that the method of marketing and financing the crops was carried out on a basis which gave the producer no encouragement to grow a sample of high quality, especially in regard to the milling qualities of the grain grown for sale. With the exception of wheat, the question of quality was of paramount importance in produce exported overseas. With wheat, the producer who grew a first-class high-quality sample received no more for his product than the careless and indifferent farmer. The immediate result of the f.a.q. system of marketing of wheat was that the farmers' attention had been concentrated solely on those varieties which would return the highest yields per acre, irrespective of the quality of the grain. Such a practice had resulted in the neglect of the cultivation of varieties of wheat with high milling qualities. The attitude of the farmer was, of course, perfectly rational, for while such marketing conditions continued it was idle to expect him to grow any other than the most prolific varieties of wheat. His ideal variety of wheat was naturally the one that would fill the bag. The miller, on the other hand, preferred those varieties that would mill readily and yield on milling a high percentage of flour of good color. The ideal variety for the baker was one that gristed a flour of high strength, a flour that would yield a maximum of well-piled loaves of bread of good color, texture, and quality per sack of flour. The wheatbreeders' ideal was to produce a variety that would completely satisfy the farmer, the miller, the baker; and the problem in all countries where wheatbreeding was actively carried on was to produce varieties which were prolific, and which on milling yielded a high percentage of flour of good color, high strength, gluten content, and good baking quality. It was commonly supposed that it was not possible to combine in the one variety of wheat

high yielding capacities and high milling and baking qualities. That impression had probably gained ground because varieties of high-milling quality at present grown in Australia were frequently poor croppers. The home-grown wheats of England were invariably soft, white, of low strength, and, in comparison with Australian wheats, sold at reduced rates. "Can high-strength wheats be grown in Australia?" "Undoubtedly, yes!" It was formerly thought that wheats of exceptional strength could not be produced under Australian skies, and that there was something in our climate that prevented locally grown wheats from rising beyond a certain measure of strength and gluten content. Varieties had been evolved under Australian conditions that were equal in milling quality to any wheats in the world, but, unfortunately, these varieties generally gave indifferent yields when grown in the field, and they were, therefore, not popular with farmers.

OWEN.

February 17th.—Present: 16 members and visitors.

CARE OF FARM MACHINERY.—"The farmer's implements are his tools of trade, by which he earns his livelihood, and they should, therefore, be looked after very carefully," said Mr. Freebairn, in a paper under the above heading. Continuing, the speaker said widely divergent views were held by farmers as to the best method of keeping the machines under cover, but he expressed a preference for the iron structure, because the danger of fire was reduced to a minimum. Mr. Freebairn stated that he always made a practice of looking over the machines before commencing work, and if any of the cogs or bearings were worn, he placed an order for a new part, in case a breakage occurred. His experience with new parts was that they did not last so long as those supplied with the machine, and while a bearing was doing good work, even though it was worn, he would not take it out

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of the machine. At seeding time the drill came in for a good deal of constant work, and if the operator noticed that the machine was inclined to "pull heavy" it could be taken as a sure sign that the fertiliser feeders had become gummed up, and required cleaning. At the completion of seeding operations the drill should be thoroughly cleaned out and placed under cover until next season. The binder was one of the greatest labor-saving machines on the farm, and with proper care could be relied upon to give many years of faithful work. He had been using the same binder for 17 years, a fact that he attributed to housing the machine and regular overhauls. The harvester was also an important part of the farm's equipment, and when the season was finished he always gave the belts a dressing of neatsfoot oil. The cultivation implements did not require a great deal of attention, but in order that good work might be performed by the plough, he suggested that when that implement had been properly set, and was making a good job of the fallowing, the furrows should be marked, so that if they happened to become displaced they could be reset in an instant. Good shares, cutting the correct width for the cultivator, were most necessary on that important implement of cultivation. The trolley and wagon should also receive their share of attention, grease being applied at regular intervals during the carting season. Now that the majority of farms were equipped with an engine and cutter, it was advisable to have the machine housed in a weatherproof shed. In the discussion that followed, Mr. C. Marshman thought it advisable to overhaul the implements when they had finished work for the season. Paint should be applied to the woodwork of all machines, and oil to the belts. Mr. J. Lake said the high cost of machinery should make the farmers more careful of their implements. He suggested the use of tar on the swings as a preservative for the wood. Every farmer should have a forge and drill, as well as a set of taps and dies. He considered it a good plan to have all the implements in one shed, with the blacksmith's forge in the centre of the building. Mr. Freebairn stated that a straw shed was just as effective as an iron building, with the exception, of course, that one was more liable to catch fire than the other. Mr. R. Harkness considered it the best plan to repair the implements during the slack times of the year. Mr. W. Marshman spoke of the necessity for keeping all implements thoroughly oiled and greased.

Future meetings of the Branch will be held on March 17th, April 14th, May 12th, June 16th, and July 14th.

#### TWO WELLS (Average annual rainfall, 16.36in.).

January 12th.—Present: 13 members.

MIXED FARMING.—In the course of a paper dealing with this subject, Mr. A. A. Wilson said their district was eminently suited to the raising of fat lambs and dairying, in conjunction with cereal growing. To carry on profitable operations the farmer should have a holding containing not less than 450 acres, and of that area 150 acres should be set aside for cultivation, the remainder being used for grazing purposes. Good cultivation was most essential, and the growing and conservation of fodders was one of the most important points in the successful working of the property. A herd of 12 good dairy cows, true to type, should return from £200 to £240 per year. In building up the herd the services of the best sire procurable should be obtained. Just at the present time the rain had spoiled much of the dry feed, so that he considered the dairyman should supplement the grazing with hay. For the man who had a young family, he thought sheep would be a better proposition than dairying. With a flock of from 100 to 200 breeding ewes, 150 lambs per year could safely be reckoned on, and these, if prepared for market during July or August, should yield a very payable return; but as a rule the feed at that time of the year was not over abundant, so that it would be necessary to resort to hand feeding with good fodders. He expressed the opinion that the crossbred ewe was the best mother from which to breed lambs for the export markets. Both the Dorset Horn and Shropshire rams had been used by him, and they had given excellent results. For the successful management of the flock he suggested that a small paddock should be made close to the home-stead, and the rams yarded with the ewes every night for a week. A cool day, with a gentle breeze blowing, should be chosen for the work of marking and tailing. The lambs should be handled quietly, and the purse and tail should be treated with a weak disinfectant after the operation had been performed. It was also important to give the lambs the run of a clean paddock for a few days, in order to minimise the danger of dirt getting into the wounds.

**WILLIAMSTOWN (WOMEN'S).**

February 1st.—Present: 14 members.

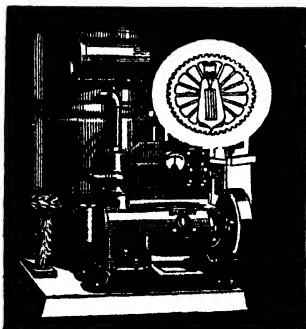
**HOME NURSING.**—Mrs. Williams, who contributed a short paper on this subject, said the sick room should be well lighted and ventilated, the doors and windows being open to admit plenty of fresh air, but care should be taken not to place the patient in a draught. No food or drink should be kept in the same room as the invalid. Linen should be changed at least once a day, and the patient sponged all over once or more during every 24 hours. There would be no danger of the sick person taking cold if the whole of the body was not exposed at the same time. If the patient was at all feverish, a little vinegar and brandy added to the water would prove beneficial. If laid up for any length of time, the body should be rubbed with methylated spirits to prevent the formation of bed sores. The most careful attention should be devoted to the bowels, as constipation was very often the cause of a high temperature. In the majority of cases the patient should be given plenty of cold water, as it was most refreshing, and helped to cleanse the kidneys. Patients suffering with infectious diseases should, if at all possible, be kept in a room by themselves, and their attendants should be provided with a loose cotton gown to slip on over the outer clothing. The gown should be removed before leaving the room, and hung up behind the door. Vessels of all descriptions should be washed immediately after use. It was a good plan to have a tub of hot water in the sick room into which all soiled linen should be placed before it was removed to other parts of the house. Water that had been used in the room should be buried with other refuse, and all sweepings burnt. When administering medicine a proper glass measure should be used, because spoons varied in size, and it was most important that the exact dose should be given to the patient.

The Hon. Secretary (Mrs. G. Hammatt) contributed a short paper, "Drying Fruit in Small Gardens."

**WINDSOR.**

February 7th.—Present: 15 members and five visitors.

**PREPARATION OF THE SOIL.**—"Fallowing is absolutely necessary to get the best returns from the land," said Mr. W. Carter in a paper under the above heading. The work should be commenced as soon after seeding as possible. For light soils he thought a depth of 3in. would be sufficiently deep, but on land of a heavier character an additional inch could be worked with safety. During the first few weeks following the ploughing, the harrows should be brought into operation, and if the weeds made a strong growth it would be advisable to use the cultivator. He considered it the proper practice not to work the cultivator so deeply as the plough had been worked, otherwise the decaying vegetable matter would be brought to the surface. After that cultivation, the land should be worked whenever weeds made it necessary, and also after rain had been received, to assist in the retention



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of moisture. One should endeavor to strike a happy medium so far as the condition of the soil was concerned. If the fallow was very "cloddy" it would be advisable to use the harrows when the soil was damp, while, on the other hand, it should not be worked down so finely as to cause it to drift. During the hot and dry days of the summer months, he did not think it a good plan to work the fallow, but if weeds did make an appearance, sheep could be relied upon to keep the rubbish in check. If the land had been worked properly, the weeds should not become so troublesome that they necessitated the use of the cultivator. All that should be necessary was to work the cultivator ahead of the drill, but if the fallow was late it could be cultivated after the first rain, and again ahead of the drill. Referring to the working of sandhills, the writer thought that if the sand carried a good binding coat of dandelions to keep it from drifting, he would not use the plough until the end of September, which would be the only working until the first rains, when a crop of early wheat or barley could be drilled in. An interesting discussion ensued, after which an address, "Agriculture Abroad," was delivered by Mr. H. Clark.

CLARE, December 9th.—The Hon. Secretary (Mr. H. Lowcock) read a paper, prepared by Mr. C. G. Savage (Manager of the Berri Experimental Orchard), entitled "Fruit Drying." During the discussion that followed, Mr. Jarman said he thought the strength of the dip given for Waltham Cross or White Malaga grapes, namely, 1lb. of caustic to each 8galls. to 15galls. of water, was too strong for that district. He would use 1lb. of caustic soda to each 35galls. to 40galls. of water.

GAWLER RIVER, January 16th.—A discussion took place on the recent locust plague in the district, and also the fixing of the wheat standard.

LYNDOK, February 9th.—An interesting evening was spent in discussing the subjects, "Diseases of the Vine" and the effect that the hot and dry weather was having on the vines and fruit trees. A paper on the subject "Afforestation" was promised by the Hon. Secretary (Mr. J. S. Hammatt) for the meeting to be held on April 6th.

STOCKPORT, January 25th.—Mr. B. Whitelaw delivered an interesting address, "Cross Breeding for Export Lambs." Mr. Whitelaw attended the Roseworthy Agricultural College Winter School, and the address was given from notes that he had obtained during the course. Average crop returns for the district:—Wheat, 14bush.; hay, 1½ tons to the acre.

WILLIAMSTOWN (Women's).—The following programme has been received with the Hon. Secretary (Mrs. E. G. Hammatt):—April 5th—Paper, "Care of Cream and Butter," Mrs. Gower and Mrs. Pinson; May 3rd—Paper, "Bacon Curing," Mrs. Wild; June 7th—Paper, "Food Values," Mrs. Hammatt and Mrs. Cundy; July 5th—Paper, "Home Economics and Recipes," each member to contribute something; August 12th—Annual meeting.

WILLIAMSTOWN, February 4th.—On the above date members of the Branch visited Kersbrook for the purpose of inspecting the orchards in that district. Luncheon was provided by the Kersbrook Fruitgrowers' Association at the residence of Mr. E. J. Powell, after which an inspection was made of that gentleman's orchard. A vote of thanks was accorded to Mr. Powell for his hospitality. On the morning of Friday, February 10th, a return visit was paid by the members of the Kersbrook Association to the Williamstown district. The visitors met at Mr. A. Norsworthy's residence, and inspected his orchard and newly-erected cool storage plant. The next place of call was Mr. Dawson's orchard at Mount Crawford. The orchard was inspected, and the members and visitors entertained at luncheon, for which both Mr. and Mrs. Dawson were heartily thanked. Other orchards visited included those of Messrs. W. S. Wilkins, A. W. Mitchell, E. D. Powell, and W. G. Mitchell. The visitors were then entertained by Mr. S. Winton. In the evening Mr. J. J. Bain presided over an attendance of 30 members and 10 visitors, when an interesting evening was spent in discussing the subject, "The Necessity for and the Advantages of a Fruitgrowers' Association for the District." A good debate ensued, in which the following members took part:—Messrs. E. D. and E. J. Powell, J. Osborne, G. Brown, F. Fullston, A. Norsworthy, and F. W. Trestrail.

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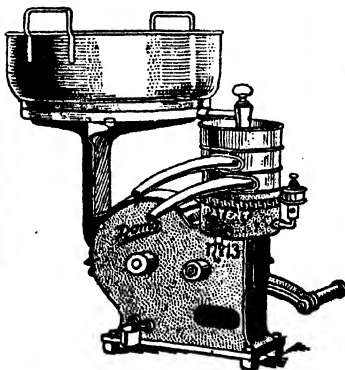
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**YORKE PENINSULA DISTRICT.**

(TO BUTE.)

**MAITLAND** (Average annual rainfall, 20.08in.).

February 4th.—Present: nine members and one visitor.

**HARVEST REPORT.**—Mr. Francis presented a report of the harvest for the season 1921-22. Seeding operations were commenced on April 25th, and completed on May 24th. Wheat of the Nugget variety was sown, one-half being sown with the land in a dry condition, the other half with the land very wet. The yield was 22bush., but the sample was badly affected with rust. Major was sown between May 25th and May 30th with the land very wet; the yield was 25bush. of f.a.q. sample. Wheat of the same variety was sown between June 1st and 18th, with the land still in a wet and sloppy condition. A yield of 25bush. was secured, but the sample was shrivelled and badly affected with rust. Field No. 4 was commenced on June 20th, with the land in fair condition, and improving until seeding was completed on June 30th. Gluyas and Canaan and small quantities of Nugget and Major were also sown from June 20th to 30th. There was a total absence of smut through the field, and the sample of each kind was plump, and weighed very heavily. A yield of 21bush. was secured from that field. Mr. Borvey reported that all his seed was sown under very wet conditions; the yield averaged 21bush., and a plot of Major averaged 32bush. Barley averaged 32bush., and was pickled with bluestone, and the sample was free from smut. Messrs. Bentley, Parsons, and the Hon. Secretary (Mr. C. A. Pitcher) also spoke.

**WEAVERS**, January 26th.—Mr. F. C. Richards, of the Department of Agriculture, visited the Branch and delivered an address, "The Work of the Agricultural Bureau." It was decided that meetings should be held on the Monday evening on or before full moon.

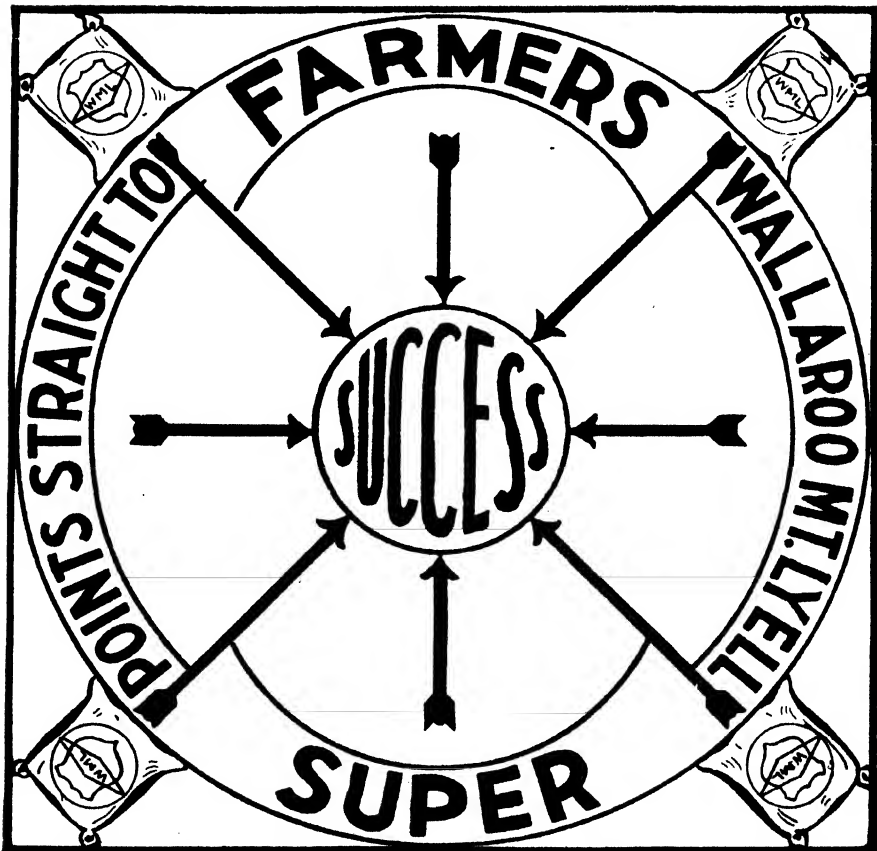
**WESTERN DISTRICT.****COORABIE** (Average annual rainfall, 11in. to 12in.).

January 14th.—Present: 10 members and four visitors.

The Hon. Secretary (Mr. H. V. Hobbs) read extracts from departmental Bulletins dealing with the subjects, "Improvement of Cereals" and "The Principal Factors Governing Wheat Yields." In the discussion that followed, members agreed that not enough care had been exercised in the past in the selection of the wheat used for seed purposes in the Coorabie district, and as a result several varieties that were deservedly popular years ago had now gone out of cultivation. Mr. Hardy suggested that the local Branch of the Bureau should obtain seed of suitable varieties every year from the Roseworthy Agricultural College, and entrust the seed to the care of some approved member to grow, and divide the resultant crop among other members of the Branch for seed purposes the following year. The Hon. Secretary (Mr. H. V. Hobbs) reported good results from Queen Fan and Caliph seed wheat that he had obtained from the Roseworthy Agricultural College, and that for the coming year he was giving Sultan a trial.

**BETTER METHODS OF CULTIVATION.**—At a further meeting, held on February 11th, a paper on this subject was contributed by Mr. G. A. Menzel. The speaker said if the farmer had grazing land to prepare for cultivation, the rubbish and grass should be burnt at the first opportunity, and a start made with the plough immediately after the first rains. Stubble land could be prepared for cropping by burning the straw after harvest, and working with the cultivator after a good rain had been received to germinate the weeds, and when these had made a good growth the plough could be brought into service. After ploughing had been completed, he recommended the use of the harrows, in order that the maximum amount of moisture would be conserved in the soil. The harrows and the farm flock would do much towards keeping the weeds in check, but he did not think they would absolutely destroy the plants. If the weeds were exceptionally bad the spring-toothed cultivator or scarifier should be used. He was of the opinion that, with the exception of soils of a heavy nature, fallowing should not be done too deeply, but the work of breaking up the land for the next year's crop should be started

early in the year, in order that as much time as possible could be given to the subsequent cultivation of the soil. Mr. Riddle, in discussing the paper, stated that he had always obtained best results from deep fallowing—land plough 4in. or 5in. deep. Owing to the difficulty of coping with wild mustard, he believed that land known to be infested with that weed should be fallowed deeply, and then not touched again until the seed was drilled in, which should be done early. Mr. Wheadon said a better or more even germination of the seed would be obtained if the drills were followed by the harrows. Some difference of opinion existed as to whether the spring tine cultivator could be worked successfully in stumpy land. It was generally agreed that, as a general rule, a second ploughing before seeding was detrimental. The Hon. Secretary (Mr. H. V. Hobbs) expressed the view that consolidation of the soil would ultimately prove to be the keynote to the successful cultivation of the mallee land, and to that end, after a thorough ploughing done as early as possible, and the use of a land roller where practicable, reliance should be placed on the harrows and the use of sheep to keep down weeds, pack the lower layers of soil, and preserve a good surface mulch. In reply to the criticism, Mr. Menzel said the spring-tooth cultivator could be worked in stumpy land, provided the tines were set back.



## ROBERTS AND VERRAN.

February 6th.—Present: seven members.

DAIRYING AS A SIDE LINE.—“To obtain the best results from the dairy herd it is necessary to breed from first-class pure-bred stock,” said Mr. M. Masters, in a paper on the above subject. He was of the opinion that farmers did not pay sufficient attention to the breeding of the cows, and contended that it would pay to start on a small scale, with a pure-bred cow and bull. Should, however, a cross be preferred, he recommended the Illawarra crossed with the Jersey. That would be an advantage in so far as the disposal of the calves and the aged animals to the butcher was concerned. The Jersey, from an economical point of view, both as regards feeding and high percentage of butter fat, was an ideal cow. Sheltered milking yards should be erected, and regular feeding and milking hours adopted. Small paddocks close to the homestead could be sown with green fodders, into which the cows could be turned after they had been milked at night. That would save a good deal of time in the morning, for it would not be necessary to go to the distant paddocks for the animals. An endeavor should be made to cultivate a small plot of lucerne for the benefit of the stock during the summer months. Mr. B. Evans, in discussing the paper, favored a large breed of cattle, such as the Ayrshire or Shorthorn for the farmer. Lucerne could not be grown with any great success in their district, but ensilage was relished by dairy cattle, and most of the crops used for that purpose could be grown in that locality. Mr. F. Masters said he was glad to note that the speaker had made such a strong point of the importance of pure-bred stock. He strongly advised the careful selection of the animals that were to form the foundation of the herd, and urged members to keep nothing but the best stock. The testing of milk he believed to be necessary in order to ascertain the performances of each beast. Mr. C. Kunst was an advocate for the introduction of good and pure breeds of cattle, and careful attention to the fodder supplies for the summer months. Mr. B. Evans then contributed an interesting paper, “Mixed Farming.” Further meetings of the Branch will be held on April 6th and May 11th.

GREEN PATCH, February 14th.—Mr. E. M. Sage read an article, “The Use of the Silo,” and an interesting discussion followed. Other matters of local interest were brought forward for consideration.

LAKE WANGARY, January 21st.—Mr. F. Puckridge read an article, “The Influence of Artificial Manures,” which was responsible for an interesting discussion. Other matters of local interest were also brought forward for discussion.

MALTEE, January 13th.—At the inaugural meeting of the above Branch the Chairman (Mr. J. Shorne) delivered an address, “The Advantages of the Agricultural Bureau.” A programme of meetings for the ensuing three months was arranged, and it was decided to hold meetings on the Friday night on or before full moon. Several matters relating to stock ailments were also brought before the members.

McLACHLAN, January 14th.—The following programme of meetings has been received from the Hon. Secretary (Mr. W. F. Attick):—March 11th—Paper, “Mixed Farming,” Mr. T. Bailey; April 8th—Paper, “Seeding Operations,” Mr. W. F. Attick; May 6th—Paper, “Working of Farm Implements;” June 10th—Paper by Mr. Roe; July 8th—Annual meeting and election of officers. Several items of local interest were also brought forward for discussion.

MILTALIE, January 14th.—A special meeting was held on the above date, when the subject, “Destruction of Locusts,” was brought before members for discussion. Other matters, including “The Best Wheat for the District,” were also discussed.

MILTALIE, February 11th.—The Hon. Secretary (Mr. W. G. Smith) read an extract, “Fruit Tree Planting,” and a good discussion ensued. Several other matters of local interest were also brought before the meeting.

**EASTERN DISTRICT.****(EAST OF MOUNT LOFTY RANGES).****BARMERA.**

January 10th.

**VEGETABLE GROWING.**—Mr. C. R. Lewis, of Berri Branch, contributed the following paper on this subject:—"The four points essential to success are good soil, good seed, good cultivation, and water. Good soil is not always obtainable in conjunction with water. However, as the area of land required to produce vegetables for an ordinary family is not great, it may be improved by the addition of fertilisers, turning under of green crops, particularly peas or beans, stable manure, leaf mould, blood, &c. Although land can be made suitable for vegetables, I would only recommend this where it is convenient to the water system. It is much more satisfactory to select a deep loamy sand, rich in humus. The only way to success is to be sure that the land has a superabundance of humus. After decay it not only provides plant food, but it acts as an absorbent of moisture, and retains it, making it possible for plants to receive full benefit from phosphates and potash fertilisers, which are of little service without humus. Vegetables, and particularly salads, must have continuous growth. Actual experiments have proved that 100lbs. of sand will hold in suspension 20lbs. of water, 100lbs. loam 45lbs., and 45lbs. humus 140lbs. Humus forms the only hope of those who have to rely on ordinary irrigation. With it one may grow onions, spring crops of potatoes, pumpkins, melons, and most vegetables that can be established in the winter or early spring; but for a continuous supply during the summer, a good water supply is needed. As to the second point, good seed, if growing vegetables on a fairly large scale, grow your own seed as soon as you possibly can. This has been impressed on me by observation, and during the present season I have seen potatoes yielding only a few small miserable tubers—poor seed, small, and from exhausted potatoes. Planted under exactly similar conditions, but from good, large seed, a very fine crop of potatoes was harvested, 98 per cent. of which was saleable. In the same garden now can be seen cucumbers from seed saved last season and new seed purchased, sown during the same day, within a few feet of each other, and both being from early types. The purchased seed was two weeks later coming into bearing, and not half so prolific as the seed which was saved. To the man growing for sale that two weeks means money. Constant examples of this kind have caused me to rely on my own grown seed. To save cauliflower seed, cover each flower with a gauze net so that no flying insects, such as bees, can enter and inoculate the cauliflower with turnip or cabbage, which is sometimes the case with seeds retailed by seedsmen. I have seen men collecting onion seed from onions planted for the purpose, because they sprouted to such an extent as to be of little service for kitchen use. Seeds from such could hardly produce a keeping onion. As a broad rule, if one wishes to produce keepers, get the seed from the best keeping onions obtainable. The same applies to every variety. I have dwelt on this selection of seed, because it often happens that, after observing all the necessary laws for success, such as good soil, attention, and watering with judgment, the whole plot is a failure, because the seed comes from poor stock. Be careful of the plants from which you raise your seed. See that they are true to type, well developed, and free from disease. In speaking of well-cultivated vegetable ground, I mean land so worked that from 3in. to 6in. of the top surface is perfectly loose. The depth of ploughing or trenching depends upon the nature of the subsoil. If it is good down to 3ft. and fairly loose, ploughing a foot deep will be sufficient. If good, but stiff, subsoil, trenching and working in lime and stable manure would be of benefit. If stiff and clayey, resort to subsoiling, so as not to bring the clay to the surface, and apply heavy dressings of lime or gypsum. The cabbage requires a heavily manured and deeply cultivated soil. Stable manure and bone dust have given me the best results, with sometimes a light dressing of sulphate of ammonia. I have often produced cabbages up to 20lbs. in weight. The cabbage is a gross feeder, and, given moisture, can be



heavily manured. Cauliflowers are in the same class. There should be an abundance of humus, deep cultivation before planting, and constant stirring of the surface afterwards during the growing period. No weeds should be allowed to grow. The distance of planting, of course, varies with varieties. For root crops, such as turnips, carrots, beetroot, parsnips, &c., the ground should be deeply worked, and no new stable manure applied. Land that has been heavily manured for cabbages makes a good bed for root crops, most of which do well in a loose, open soil of a good depth. This type of soil is also the best for onions, but good crops can be produced on stiff soil, providing it is rich. The onion can certainly be grown on a wider range of soils than any other vegetable with which I am acquainted. On the banks of the Murray I have harvested 20 tons from an acre of onions, and averaged over 12 tons for 10 years. In a fairly good season, onions planted out from the seed bed in May should mature in October or November, just when the old onion is getting scarce. To do this the seed should be sown in March. I have frequently planted out early seed in February, and planted out late in April, and secured upwards of £1 per cwt. for the early crop. Of course, only early maturing varieties should be sown for this purpose, and I do not know of any early onions that can lay claim to be a keeping onion. I generally planted an onion known as Early Barlotta, not that it was a specially good variety, but it always bulbed well and came early, followed by Silver Skin or White Spanish and Hunter River Spanish. For keeping purposes, Brown Spanish or Brown Globe can be recommended. By careful selection I have kept Brown Globe till the October following harvesting in March. If you have a sufficiency of water, onions may be planted out up to December by selecting cloudy days, and following with several waterings about eight or nine days apart; but under ordinary conditions I do not recommend planting so late in the year. Plant them so that the onions are well established before the hot days come, and, if relying on irrigation, as in vogue on an orchard, special working of sand is required, and the soil should be rich in humus so that it will retain moisture, and as soon after the irrigation as possible the surface of the onion bed should be worked into a perfect muleh. Onions do not require such a great amount of water, but they do require careful cultivation. Potatoes can be grown along the banks of the Murray; but under irrigation care is needed in the times for applying water. I have grown many fine crops, and had very few failures, but those few taught me when not to apply water. If the land is properly worked, two crops of potatoes can be taken off in a year. The first crop must be planted, say, during late July, the eyes being well started before planting. There is a little risk of damage from frost; but I did it for many years, and did not lose a crop. The second crop should be planted during the first week in February. I have tried planting earlier; in fact, the best crop of autumn potatoes I ever grew were planted between Christmas and New Year's Days, but it was a cool January, and several thunderstorms came along at opportune times. Taking all conditions into consideration, I favor early February. The tubers should then be matured before any frost affects them. I think it probable that some of the new varieties might do as well or even better than the varieties I grew, because I have not grown potatoes for sale for nine years. Beauty of Hebron, Snow-flakes, and White Elephant did well, also Carmen and Victoria Pinkeye; the last-named variety was my best autumn potato. I grew Up-to-Dates for several years, and found them very consistent and reliable, but not so heavy a cropper as White Elephant. It was my practice to cut the seed potatoes, if fairly large, to one strong eye. If not well developed, I would leave two eyes, making the sets of fair size. In some experiments I have had very good results from very small sets cut from good potatoes. I think, however, it is best to have fair-size sets in using small potatoes. Plant them whole up to the size of a hen's egg. In preparing the ground under irrigation for autumn planting, give it a good soaking, and, as soon as possible, work up the land perfectly. Then plant well-developed potatoes, so that they may come up and make good growth prior to watering again. I have found that if you plant the seed, then water them when the ground is hot, many of the sets will rot, and the crop prospects are spoiled early in the season. If the potatoes begin to droop and stop growing it is no use watering. It will induce a large growth of top, and the tubers will send out growth in the form of large roots with a number of small tubers growing on them. For successful potato growing under irrigation, a steady growth must be kept up from start to

ripening period. Do not water after the flowering period is over. Tubers must be firm, and not in such a condition that the skin rubs off when handling. Successful potato growing under irrigation in a hot climate needs care and experience, but it can be profitably done where plenty of water is available. The tomato will grow very easily on the river. I have received 24s. per case for tomatoes grown in the open, but the river traffic is too uncertain to go in for tomato growing on a large scale. By staking and pruning the plants early in the season, larger and cleaner fruit will be obtained; but tomatoes will yield very heavy crops if on good soil without any care whatsoever if given a little water occasionally. Varieties.—Yates' Early Red, Burwood Pride, and Chalk's Early Jewel were my market sorts. Very little moisture is needed to grow melons, river pumpkins, and trombones. By a few irrigations they can be made to bear very heavy and profitable crops. I find that for sale purposes, trombones, hubbard squash, and ironbark pumpkins are the best varieties. French beans will grow well on the river. I have grown very heavy crops of Caseknife, Emperor William, and Canadian Wonder. Even the delicate waxbean grows to perfection. French beans are restrained by the frost, but during the remainder of the year they can be had in abundance if judgment is exercised in applying water. Celery can be grown successfully. The easiest way to blanch it is by placing pipes or hollow mallees over the plants when young. The old trench system, or wrapping, can also be adopted. Rhubarb can also be grown with a little care. I have tried almost every kind of vegetable, and find that there is no reason to send to the Adelaide market for supplies, because the river country will supply all our needs."

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## RAMCO.

December 15th.—Present: 16 members.

**BUILDING HAYSTACKS.**—Mr. R. Stanley contributed a short paper on this subject. The cost of growing hay, the labor required, and the risks in getting a crop, he said, should make orchardists more careful when conserving fodder. Hay should be cut when not too ripe, and stooked as soon as possible, and then carted to the stack with a minimum of delay. The foundation for a stack containing from 5 tons to 6 tons of hay should measure 9ft. by 15ft. A peg should be placed at each corner, and the stack built to a height of about 4ft., with the walls worked outwards to a height of 8ft. or 10ft. The top should then be drawn in gradually, and the centre kept well filled. Small stacks should be left for a day or two to set before being roofed. During the discussion which followed, Mr. F. Lewis was of the opinion that it did not pay to grow hay in an orchard. Mr. Burton thought that large stacks were more easily erected, and it was better, he said, to make a stack greater in length than in width.

**DOES IT PAY TO MANURE AN ORCHARD?**—Mr. C. Boehm, in a paper on this subject, did not condemn manuring, but he failed to see the benefit derived from the general method of manuring. By that he meant putting the same kind and quantity of manure throughout the block, regardless of variation of soil. Manuring at the right time seldom coincided with an irrigation, and to manure without an irrigation, or shortly after, or at the wrong time of the season, did more harm than good, and was a waste of time and money. To manure in furrows near rows of trees or vines was not to the best advantage, because it drew the roots in clumps along the manured tract, and they became too cramped and crowded, and with any lack of moisture they would suffer more than trees with scattered roots. To serve the best purpose the manure should be broadcasted and ploughed in. He thought manuring had become more a habit than a necessity, and it had many drawbacks besides those already mentioned. A well-manured block was far more susceptible to disease than a non-manured block. Manure was used to force growth, and by forcing a tree to grow and bear more fruit than it should, weakened it and shortened its life. The aim of the orchardist should be to keep his block in a profitable state for the longest possible period. Trees and vines were deep-rooted, and naturally did not depend on manure for their existence. They were just the reverse from annual or quick-rooted growing plants. Then also, the effect of the various chemical manures on the different soils still remained a debatable point. He had asked several growers who manured constantly if they harvested a ton or more of fresh fruit per acre, and the answer was "No" in each instance. After considering the price of manure, and it required at least 4cwts. per acre to make any noticeable difference, and the time it took to procure that quantity, the cost of cartage, and the extra labor and expense involved, he came to the conclusion that manuring did not pay. During the discussion which followed, Mr. F. Lewis thought that the wrong sort of manure was often used. He had applied manure for several years, and noticed that the crop was smaller after an application, but it showed improvement the following season. The fertiliser should be spread over the block and dug in deeply. He knew of no grower who had indisputable proof that manure was doing good. Mr. Stanley said roots came up after manuring, and they should be cut off. He agreed that trees and vines forced with manure were more delicate, and therefore could not stand a dry spell. He favored the application of stable manure. Mr. Green said that if the land was ploughed frequently when the trees were young the roots would be forced down. The best fertiliser he had used for trees and vines was blood manure. Mr. W. Robinson agreed that organic manure was superior to inorganic manure. It created humus, and altered the physical features of the soil. He considered green manure was best for their district.

**BARMERA, February 7th.**—Mr. H. F. Levein (manager of the Berri Co-operative Packing Union) delivered an interesting address, "The Birth, Growth, and General Principles of the A.D.F.A." Matters relating to the forthcoming pruning competitions were also brought before members.

**KINGSTON-ON-MURRAY, January 28th.**—The Chairman (Mr. C. Dixon) presided over an attendance of seven members. Matters of local interest, including "Locust Destruction" and "The 1922 River Murray Pruning Competitions," were brought forward, and an interesting discussion ensued.

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## SOUTH AND HILLS DISTRICT.

CHERRY GARDENS (Average annual rainfall, 35.03in.).

February 7th.—Present: 12 members.

**MOTOR *versus* HORSES.**—In the course of a paper under the heading, “Motor *versus* Horses for Haulage Purposes,” Mr. H. Strange said he intended to confine his remarks to vehicles used for commercial transport. The first and most essential point was to secure a lorry of the best make, and one adapted to the nature of the work that had to be performed. The initial cost of a lorry to haul a 3-ton load through the Adelaide Hills was admittedly considerably more than that required to secure a team of horses capable of performing the same work; but the work entailed in looking after the animals was very much in advance of the labor that had to be expended on the motor. Then, again, a comparison of the motor with a team of the same haulage capacity resulted in a decision in favor of the mechanical power. The motor lorry would haul a 3-ton load from Adelaide to Cherry Gardens in one and a half hours, but the horses would take five hours to do the same journey. For the last 11 years he had used motor power for conveying produce to the city, and he had no hesitation in saying that the motors of to-day were absolutely reliable. The following comparisons in the two methods of haulage were then quoted by the speaker:—**Horses.**—The man commences work at 7.30 in the morning—Half an hour for grooming, feeding, and harnessing; 15 minutes to put team in trolley; 4½ hours to city; 1½ hours feed and unload; 4½ hours journey back; 1 hour feeding, grooming, and bedding for the night; total, 12½ hours, or 1½ days at 12s. per day, 18s. Horses can only do four trips a week, and not much back carting. **Motor.**—Man comes to work at 7.30 a.m.—1½ hours to city; 1 hour to unload; return trip, brings the same weight back in 1½ hours; and half an hour to look after motor, or 4½ hours. If loaded in the morning, 1 hour extra, or a total for the trip of 5½ hours, at 1s. 6d. per hour, 10s. 6d. A motor will easily do the trip every working day, which would amount to a saving of £3 3s. a week. In addition to this there would be the back cartage. **Average cost of motor trip:**—Running expenses, £1; driving expenses, 7s. 6d.; total, £1 7s. 6d. **Average cost of horse team trip, feeding, &c.,** £1; driving expenses, 18s.; total, £1 18s. Six horses’ trips cost £11 8s.; six motor trips cost £8 5s., or a saving of £3 3s.

LENSWOOD AND FOREST RANGE (Annual average rainfall, 35in. to 36in.).

December 12th.—Present: 10 members.

**UTILISING FOREST LAND.**—In the course of a paper under the title “Utilising Our Land after the Timber has Been Removed,” Mr. J. Green said after the marketable timber from the trees had been removed, the tops should be cut for firewood or burnt for charcoal, both of which were profitable undertakings. Early in the winter he suggested the planting of pines. It would not be a great number of years before the natural timber was all cut out, and no time should be lost in undertaking the work of afforestation. If a good area was devoted to pines, there should be no difficulty in inducing one of the timber firms to open a box factory, which would prove a great boon to the gardeners and orchardists, as it would save a lot of carting. The wattle did exceedingly well in the hills districts, and once the seed had been planted the trees required practically no attention until they were ready for stripping. The speaker was also of the opinion that it would be a good plan to sow grasses to improve the pastures, although he realised that the procedure would entail more work in clearing the land of stumps and rubbish.

LONGWOOD (Average annual rainfall, 37in. to 38in.).

January 14th.—Present: seven members and six visitors.

**HOMESTEAD MEETING.**—The monthly meeting of the Branch was held at Messrs. A. & H. Gurr’s homestead. An inspection was made of the poultry yards, houses, scratching pens, and birds. The yards and houses have accommodation for 400 birds, and during the past season 230 pullets were reared. The Messrs. Gurr Brothers were complimented on the cleanliness and the progress that they had made since launching out into the poultry industry two years ago. The Poultry

Expert (Mr. D. F. Laurie) and Poultry Inspector (Mr. C. F. Anderson) were present, and an address, "Poultry Keeping in the Hills," was delivered by the first-mentioned officer.

MEADOWS (Average annual rainfall, 35.52in.).

January 11th.—Present: 19 members.

DAIRYING AND MIXED FARMING.—In a paper on this subject, Mr. Hirschfield said that owing to the high cost of living and the high wages which were ruling at the present time, dairy farming had become a very unprofitable proposition unless the farmer was a good manager, and had his farm so organised that he could cope with most of the work himself. The greatest drawback to the hills dairy farmer appeared to be the fodder question. Owing to the abundant rains that difficulty should not present itself, because the district was so suitable for the growing of summer crops. The most profitable fodder, he thought, was lucerne. It had a high reputation as a milk and cream producing fodder, and owing to its cheapness it could not be equalled. Some farmers were of the opinion that lucerne was a dangerous fodder, because cattle sometimes became blown after feeding on it, but he said the trouble would be avoided if it was cut two hours before being fed to the stock. If cows were allowed to graze on lucerne, the milk and cream would be very rank, and would not make first-class cheese or butter. During the winter months of last year he fed his cows on oaten chaff and bran, and during the month of September he was making 45lbs. of butter per week from 12 cows. On October 1st he commenced feeding them on lucerne, and by the third week in October the butterfat had increased from 45lbs. to 72lbs. per week, and the condition of the herd showed a marked improvement. The three most profitable items in dairy and mixed farming were cattle, pigs, and poultry. Pigs were very profitable if properly cared for. He did not advise keeping the breeding sows in prime condition, but rather on the lean side whilst carrying a litter. Great care should be

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taken when the pigs were first born. The litter should be removed for about three hours after birth, in order to let the mother overcome the pains and settle down quietly; the young pigs could then be given back to her. Very little bedding should be allowed until they were about three days old, because they might become entangled, when the mother was likely to lie on them. The young pigs should be allowed to remain with the mother for at least six weeks, and during that time they should be allowed to run about freely. A small trough should be filled with skimmed milk three times a day, and placed where the mother could not reach it. At the end of six weeks they should be weaned and kept in a sty until they were turned out as baconers. Pigs would mature more quickly in sties on two feeds a day than if kept in large yards and given three feeds a day. Most farmers in the hills districts reared and fattened their pigs on whole peas, but he thought that was a great mistake, because of the great amount of waste that occurred. Owing to peas being a very heating food, they should be crushed and fed to pigs in the following manner:—“From six to 10 weeks old, about  $\frac{1}{2}$  pint of peas,  $\frac{1}{2}$  pint of bran, with about 2 pints to 4 pints of skimmed milk, fed about three times a day. From 10 to 15 weeks old,  $\frac{1}{2}$  pint of peas,  $\frac{1}{2}$  pint bran, with about  $\frac{1}{2}$  gall of skimmed milk. After 15 weeks of age, 2 pints of peas, 1 pint bran, and 1 gall. of skimmed milk, fed three times a day.” The pigs should weigh at least 100lbs. each when 20 weeks of age; they would then be suitable for curing. Charcoal should be fed to pigs very freely, in order to prevent indigestion. A good discussion followed the reading of the paper.

#### MILANG.

November 12th.—Present: 26 members.

An interesting meeting was devoted to a debate on the subject, “The Merits of the Harvester *versus* the Stripper.” Messrs. J. P. Bagley, J. McMillan, and W. S. Day spoke in favor of the harvester, while Messrs. E. L. Williams, C. J. Landseer, and J. M. Yelland debated the merits of the stripper.

At a further meeting, held on December 10th, a paper, “Employment of Idle Moments on the Farm,” was contributed by Mr. W. S. Yelland. A lengthy discussion followed.

#### MOUNT PLEASANT (Average annual rainfall, 26.87in.).

February 10th.—Present: seven members and visitors.

THE DAIRYING INDUSTRY.—Mr. E. J. Tapscott, who contributed a paper dealing with this subject, said the selection of the cows was the main point that had to be considered by the man who intended starting a dairy. The purchase of animals from a proved strain of high milk producers might seem somewhat expensive at the outset, but in the long run it would prove to be a saving of money. If it was possible each animal should be tested, so that the unprofitable cows could be culled from the herd. Kindness and patience should be exercised when bringing the animals into the milking yards, and for the best results regularity in both milking and feeding hours should be observed. The cows should not be kept for too long a period in the one paddock, but given a frequent change of pasture. An abundant supply of fresh, clean water and green fodders during the summer months was of paramount importance. Of the summer fodders he expressed a preference for lucerne, and for the winter an excellent ration consisted of oaten chaff, bran, and crushed oats. A bowl of water and a towel should be provided in every milking yard, in order that the hands of the milkers could be washed after each cow had been milked. When the cows had been turned out, the yard should be swept clean. Too many precautions could not be taken when handling the products of the cow. Good butter could only be manufactured from good cream. The cream should be kept in a cool place, and kept well stirred with a wooden spoon. It was a mistake to mix the cream straight from the separator with the cream in the can. The bull played an important part in the ultimate success of the herd, and every dairy farmer should endeavor to maintain a high-grade animal. He thought the best plan was to stall feed the bull, and not allow him to run at large with the cows. The calf of to-day was the cow of to-morrow, and every care should be bestowed on the young animals during their early life. For the first few days after its birth the calf should be allowed to have its mother's milk, after which it could be diluted with separator milk, and when one month

old the calf should be allowed all the separated milk it could drink. Scalded linseed meal and pollard, and a little salt added to the milk, gave the animals a nice coat and healthy appearance. He had found that a small quantity of chaff given to the young animals night and morning prevented, to a large degree, trouble with scouring. All heifer calves should be carefully examined early in life, and any animals with more than four teats should have the extra teats removed during the first few days. Pigs were closely connected with the dairying industry, and, like other farm animals, required proper care and attention, if they were to be raised in a profitable manner. They required clean and cool sties in the summer, and plenty of fresh straw in the winter to keep them warm. The sow, as farrowing time approached; should be kept quiet, and disturbed as little as possible. Rails about 6in. or 7in. high and projecting from the sides of the sty should be provided to allow the young pigs to get out of the way of the sow when she wanted to lie down. The straw in the sow's sty should be reduced to a minimum; neither should she be fed too liberally. A warm bran mash was practically as good as milk, and also acted as a medicine. Before weaning the little pigs should be taught to drink with their mother. A good plan was to use one of the adjacent sties that had been provided with a small opening, through which the young pigs could walk and feed alone if they so desired. At the age of six or seven weeks the pigs should be weaned. At that stage they should be given plenty of good, wholesome food, and when 10 weeks old they should bring 30s. per head in the market. Good drainage from the sties should be provided, and if the trough was allowed to project outside the sty it would save a lot of unnecessary lifting, and prevent the animals from being knocked about when the feed was placed in the trough.

#### ROCKWOOD.

January 16th.—Present: 21 members.

**MACHINE versus HAND MILKING.**—The meeting took the form of a debate on this subject. Mr. E. Rogers opened the discussion in favor of the machines. He said there was no doubt that the mechanical milker saved a great deal of time and labor. One man could look after four machines, and in the 15 months that he had been working the machine he had never seen a bucketful of milk spilt, which was rather a common occurrence when the cows were milked by hand. The pigs and calves could be fed while the cows were being milked. In further supporting the advantages of the machines, Mr. Meyer said the great success of the invention was due in no small way to the suction, which was an almost perfect imitation of the calf sucking its mother. If the yard was properly and conveniently laid out, one man could look after four machines. Most of the cows milked with the machine did not require stripping, and he was firmly convinced that any dairyman with more than 12 cows should instal a machine. He also contended that the animals milked with the machine were more contented, and stayed in milk for a longer period than the cows milked by hand. From his experiences he would say that it cost 6d. for fuel for each milking. Mr. Carter had no hesitation in saying that the machines had been the salvation of the dairying industry in South Australia, chiefly because of the very great difficulty in securing suitable and constant labor for the dairy farms. He had been using the machines for 10 years, and had never had a cow lose a quarter. Cleanliness was a most essential factor in the success of the machines, but that also applied to all operations connected with the handling of dairy produce. A plant could be installed for about £150, and 2s. per day would cover all running expenses. Mr. Dunn, in supporting hand milking, mentioned that he had noticed very dirty machines on some of the dairy farms, and he was also of the opinion that it was necessary to strip the cows after milking. He doubted whether one man could attend to four machines. Mr. Simmons stated that he was not favorably impressed with the machines; the initial cost of the outfit was very high; and, as a rule, owners of high-class stock always milked their cows by hand. Mr. Steed was of the opinion that only the dairyman with a herd of 20 cows or over required a machine, and he also contended that the cost of installation was too great. He did not think that a great deal of time was saved with the machines. The Chairman (Mr. J. J. Bradford) declared the speakers who advocated the machines the winners of the debate.



ASHBOURNE, January 16th.—The chairman (Mr. H. Meyer) read an article from the *Journal of Agriculture*, "The Pig Industry," and an interesting discussion followed.

BALHANNAH, January 11th.—A number of members attended a meeting of the Mount Barker Branch on the above date to hear Mr. E. Ashby's address on "Bird Life."

On February 4th the Poultry Expert (Mr. D. F. Laurie) visited the Branch and delivered a lecture, "Suitable Poultry Breeding for the Hills," before a gathering of 27 members.

BLACKHEATH, January 13th.—The meeting was devoted to the compilation of a programme for the ensuing six months, and several items of local interest were brought forward for discussion. Mr. H. Paech tabled a sample of berseem clover 2ft. high. The seed was sown in November, and Mr. Paech stated that the sample exhibited was the second cut taken off the crop.

BLACKHEATH, February 10th.—The meeting was devoted to a review of the past season and harvest reports. It was generally agreed that the crops were very disappointing, not yielding nearly so much as the stubble indicated. A member stated that the variety of wheat known as "Ford" had given exceptionally good returns, even though the ripening periods had not been very favorable.

BLACKWOOD, January 16th.—The monthly meeting of the Branch was held at the Government Experimental Orchard, when an interesting address, "Apple Growing," was delivered by Mr. G. Hannaford, and a lengthy discussion followed.

CHERRY GARDENS, January 11th.—A short paper, "Prevention is Better than Cure," was read by Mr. H. Jacobs, and an interesting discussion followed.

HARTLEY, December 14th.—Mr. J. Stanton contributed a paper, "Marketing the Farmers' Wheat," and an interesting discussion followed.

MORPHETT VALE, February 9th.—Among the various subjects brought forward was that of the practice of summer fallowing. Members considered the practice a good one where conditions were favorable. Another topic for discussion was that of the best distance at which to plant vines. It was generally contended that the highest yields were obtained from vines set out at fairly wide distances. The case of a local grower who removed alternate rows of vines and received a heavier crop was cited as an argument in favor of wide-distance planting.

## SOUTH-EAST DISTRICT.

### KONGORONG.

January 12th.—Present: seven members and one visitor.

REMEDIES FOR COWS.—Mr. A. C. Gust contributed a short paper on this subject. For bloat in cows, he recommended giving two tablespoonsful of baking soda dissolved in water and given as a drench, or half a bottle of lime water. For cows that did not chew their cud, and walked stiffly, he suggested a dose of 1lb. Epsom salts and 1 cupful of treacle in a quart of water. For warts on cows' teats vinegar and castor oil should be applied on alternate nights until they disappeared. For lice on cows he recommended dissolving 1lb. of soap in a gallon of hot water, and adding 1 pint of kerosine. It should be well stirred, and applied whilst warm. Boils on the teats and udder could be cured by the use of a little boracic or zinc ointment or a little carbolised vaseline. A very useful drench could be made up with the following ingredients:—12 packets Epsom salts,  $\frac{1}{2}$  tablespoon salt, 2 table-spoonsful ground ginger, 1 table-spoonsful caraway seeds, in six bottles of water. A good discussion followed the reading of the paper.

KYBYBOLITE (Average annual rainfall, 22in.).

February 16th.—Present: eight members.

**ADVANTAGES OF GROWING OATS IN THE DISTRICT.**—The following paper was contributed by Mr. E. C. H. Schinckel:—"Though wheatgrowing still seems to engage most of our attention in cropping operations, experience is teaching us that this crop is not so suitable to our soil conditions as oats. No more convincing proof of this have we had than in the season just past. Ready markets and prevailing high prices are, no doubt, great factors in inducing farmers to give so much attention to the cultivation of wheat, but this is a short-sighted policy, and if persisted in must eventually reduce our soils to a low state of fertility. I do not advocate discarding wheatgrowing altogether, but I do think oats should displace wheat in rank of importance in our cropping system. A very big proportion of the wheat grown on the farm is carted off, with all the fertility it contains, but if we are going to pay due regard to maintaining and increasing our soil fertility, this practice must be limited as much as possible. Naturally our soils are not very high in respect to fertility, the saddest feature being lack of humus. There seems only one way by which the supply of humus may be increased, and that is by carrying more livestock. Supers, though essential to the production of any crop here, do not increase the humus supply, excepting to the extent to which they cause increased root production. On every farm may be found illustrations of the gradual disappearance of boggy patches of land, more particularly in the small paddocks about the homestead or stables, where stock are continually grazing and applying natural fertilisers. Admitting that the oat crop is the one to which our soils are best adapted, it must afford the best means of increasing the stock-

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carrying capacity of our farms. Viewed from the standpoint of general adaptation for feeding livestock, no cereal grown will compare with oats. They can be made to form part or the whole of the ration fed to almost all classes of farm animals, because in themselves they are what we know as a balanced ration. For young or old stock, oats are without a rival in concentrated foods. No other cereal can be fed to stock with entire safety or in quantities so large for an equally prolonged period. For horses, no substitute has been found that will give and maintain the same degree of mettle and staying power, either in the racehorse or the heavy farm worker. They can be fed in any quantities, preferably crushed or ground. For cows in milk, oats are at least as valuable as bran, and for rearing young cattle they are an excellent food. For sheep, and it is here that I think the growing of oats chiefly concerns farmers in this district, oats are of great value. As a ration for breeding ewes they stand alone, while the same applies to lambs or sheep at any stage of growth. Those of us whose oat crops were affected by grubs this last season must be noticing the very great benefit our sheep are deriving from these stubbles, and it must cause us seriously to consider whether it would not be profitable to set aside a portion of our oat crops solely for grazing purposes. During the growing period oats will provide two to three months' feed for sheep if judiciously handled, and at harvest time it would be a matter for individual consideration whether the most profitable means of harvesting would be by sheep or machinery. Much would depend on the supply of fodder and the quantity of stock kept on the farm. Though harvesting with the sheep may at first sight appear wasteful, there is much to recommend it. A considerable saving in labor and expense would be effected, and while a fair amount of oats may not be picked up by the sheep, most of this would germinate, and provide excellent feed the following winter. As a feed for pigs and poultry, oats may not be so valuable as wheat, but they can be fed in fairly large quantities with very profitable results. Apart from their usefulness for general feeding purposes, oats are essential in our cropping system. They are valuable as a weed eradicator, and a most effective remedy for 'take-all.' On examining a heavy crop of oats one rarely finds any semblance of weed growth. All the leading farmers of the great wheat-producing areas of the Wimmera and mallee include oats in their cropping system as the most effective means of preventing this disease, which was so prevalent among our own wheat crops last year. Another advantage in growing oats is that they may be sown at any time during the autumn months, regardless of weather conditions, thereby helping considerably in distributing the rush of work at seeding time. Taking all these facts into consideration, we must be forced to the conclusion that other cereals must give precedence to oats in our farming operations." In the discussion that followed, one member asked the writer if he could give any approximate results of oats in comparison with wheat, also the cost of growing and preparation as regards fallowing, &c. Mr. Schinckel said that oats yielded two to one of wheat, and that it was not necessary to fallow. A disc could be used early in the season, and thus provide an extra six months' feed for stock. Another member said that oats grew better, and produced more than wheat, but there was one drawback on account of the uncertainty of markets for oats and stock, whereas there was always a ready sale for wheat. It was also asked if it was advisable to feed off oats or leave them to mature in order to obtain maximum yields. The writer considered it quite safe and advantageous to feed off crops grown on fallow as late as the end of July, or even later in good years, and still get a good yield of grain.

MILLICENT (Average annual rainfall, 29.25in.).

December 3rd, 1921.—Present: nine members.

DAIRYING.—Mr. Bowering, who contributed a paper dealing with this subject, said there were periods during the year when it became necessary to provide food other than the natural pasture. Maize was a good standby. It should be planted in rows 2ft. apart to allow for cultivation between the rows. On very good land maize might be sown broadcast. If the leaves were stripped from the stalks a fresh supply would grow. It was a hardy plant, and a good fodder. Maize should be fed in conjunction with grass or other hay. Cows were very fond of sunflower

plants. If cut when beginning to bloom, cattle would eat the whole plant. Mangolds were amongst the best-known fodders. They improved with storage. He had grown Tankards, Globes, Orange, and Long Red, but preferred the last-named variety. The roots should be stacked in convenient heaps, and thatched. Sugar beet was also an excellent fodder for dairy cows. Rye provided fine early green feed if sown with the first rains. Lucerne was well known as a most valuable crop in localities that suited it, but he had not had much success with it. A stack of grass hay was a valuable asset in the winter months, and repaid the labor involved in stacking. This year he was feeding his cows on rye, maize, mangolds, and chow moellier, and they had never looked better. In the discussion that followed, Mr. Holzgreffe said all the crops mentioned could be grown in the Millicent district. He had not had any experience with silos, but judging by what he had seen of them, they were not the success that was claimed for them. Mr. Major mentioned that in the earlier days of settlement dairying was carried on extensively around Millicent. He had carted thousands of gallons of milk at 2½d. and 3d. per gallon at the factory, and it had paid at that. To-day factories were paying 9d. per gallon, so it should be a payable industry, especially where there was a young family to assist in the work. Mr. Mullins said there was room for expansion in the local dairying industry. The establishment of a factory for the manufacture of by-products would put the dairying industry on a solid footing. Barley growing was one big industry at Millicent. He thought it was a mistake to have all their eggs in one basket. Members generally agreed that dairying was a profitable industry, especially where there was a family to assist with the work.

**WEEDS.**—Mr. Holzgreffe spoke of the spread of dock, wild turnips, and other weeds. He considered it a great pity to see valuable land with such weeds growing on it. Every farmer should weed his crops, and keep useless plants in check if possible. Useful grasses should be sown on stubble lands.

#### MOORAK.

January 19th.—Present: six members and three visitors.

**HOMESTEAD MEETING.**—The monthly meeting of the Branch was held at the residence of Mr. W. A. Palamoutain, when a discussion took place on several items of interest to the district. Mr. Palamoutain gave a full report of the recent visit of inspection to the Government Farm at Kybybolite, special mention being made of the high-class herd of Ayrshire cattle on the property.

**FEEDING AND CARE OF LIVESTOCK.**—At a further meeting, held on February 9th, the following paper was read by the Field Officer for the South-East (Mr. E. S. Alcock):—In your herds there are, I am sure, many cows giving good returns—putting up performances equal to anything in the State; but you are unable to pick them out, because you do not keep individual records. Neither do you know which is your worst cow. Even the best of cows do not give maximum returns without proper care and attention, and even on the best managed farms it is possible that some improvements might be effected. Good managers feed according to the amount of milk given, the heavier milkers requiring more food than those giving a less quantity. During the spring months, owing to the abundance of feed and warm, congenial weather conditions, the stock are at their best, but they soon lose condition, and produce less milk when the feed dries up in the field and the cold, wet weather sets in. This loss of condition can be prevented to a certain extent by judicious feeding and careful handling. Compare the treatment of the ordinary cow to that of the horse. The latter is usually provided with a warm stable, fed two or three times a day with the best hay and chaff, and generally well provided for. The cow, on the other hand, is turned out into the paddock to fend for herself, and sometimes left without any shelter or protection from the hot sun or the cold winds. The dairy cow is deserving of better treatment than this, and if given it will in the long run adequately repay the owner. Mr. F. E. Place, a Government Veterinary Officer, states that an average cow requires daily 24lbs. of digestible dry substance, 16lbs. as roughage, and 8lbs. of grain. Cows, unlike horses, will not “do” on chaff alone. They require a certain amount of long feed in order to get “acid,” and this must be provided either as hay or grass, or as a roughage of some kind. They also need changes of diet or mixed food, and the best results are obtained when lucerne hay or chaff is mixed with oatens or wheaten hay or chaff. The amount to be given should be in proportion to the size of the

cow and the quantity of milk she is giving. It is not a good plan to change suddenly from one food to another, for by so doing you will upset your cow, and, as a consequence, receive less milk. Some feeders who become anxious to increase their returns feed heavily on rich food, which, if continued for any length of time, has just the opposite to the desired effect. Changing from one class of food to another should be done gradually, so that the cow's system may get accustomed to the new diet. The main thing in handling livestock is to see that the animals are kept in good health. The good stockman notices at once when any of his stock are off-color, and, if so, immediately sets about to remedy the trouble, by first finding what the trouble is, and what is its cause. This is not an easy matter. Experience alone tells the stockman when a beast is not at its best; but it is much easier to discern trouble with the cow when the milk is weighed every day. Most livestock enjoy good health so long as their bowels are kept in good order, but when it is found that the faeces are dry and hard when passed, or when there is excessive scouring, then it is necessary to try the remedy of changing the feed. The best laxative is green, succulent fodder, and this is especially useful during the hot, dry months of the year. Provision should be made on the farm to supply this for the whole herd in the form of chow moellier, millet, maize, Sudan grass, or lucerne, &c. The use of drugs, &c., is not recommended unless ordered by experienced men, for more stock are killed annually through being given the wrong medicine than are cured. Wounds and cuts frequently occur, and should be carefully washed and kept clean with a disinfectant, but if this is used too strongly, more harm than good results. It is also necessary to use a clean rig and vessel when bathing, or a wound will be infected from this source. Then, in conclusion, do not forget licks. These are essential for the health of all stock in the South-East, and more so on the smaller holdings. In the station days, stock could be kept healthy by being changed from part of the station to another, but the man on the small selection to-day does not have the same chance, and his stock have to remain in a small area year in and year out. The main constituent in licks is common salt, which makes the food more palatable, and probably aids digestion by increasing the flow of digestive juices. If salt is put in the paddocks, and stock given access to it, they mostly take to it readily. Cows which are handled each day can be given a quantity of lick at milking time in a little chaff and bran. When cattle are noticed chewing bones, rags, posts, &c., this usually indicates the lack of salt. Bonemeal is a very useful addition to the lick, and no difficulty is experienced in getting cows to take to this. No hard-and-fast rule can be laid down for the composition of licks, but the main item is common salt, mixed with the following:—Slake lime, superphosphate, sulphate of iron, saltpetre, sulphur, bonemeal, charcoal, or molasses. The lime and superphosphate supplies the materials for bonemaking, and soon sets in cake, and not much loss occurs if protected from the weather. Sulphate of iron is a good tonic, and can be used in the water or dissolved in water and sprinkled in the feed. It also has a tendency to check scouring. Molasses is a good tonic, and acts as a mild laxative. It can also be used as a medium for the giving of other tonics or medicines which are less palatable. Some licks recommended, with the proportion of ingredients, are:—

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Coarse salt . . . . .	20	40	40	50	100
Slake lime . . . . .	10	30	30	20	40
Superphosphate . . . . .	5	20	—	—	—
Sulphate of iron . . . . .	5	—	—	—	—
Saltpetre . . . . .	—	5	—	20	10
Sulphur . . . . .	—	5	—	—	10
Bonemeal . . . . .	—	—	20	10	30
Charcoal . . . . .	—	—	—	—	—
Molasses . . . . .	—	—	—	—	10

A liberal supply of clean, fresh water is essential to the health of stock.

#### MOUNT GAMBIER (Average annual rainfall, 32in.). December 31st.

**TREE PLANTING.**—The following paper, under the title "Beautify the Homestead," was contributed by Mr. W. D. Robinson:—"The general farm should be surrounded by green growth so as to relieve the monotony and form a restful

object for the eye. Nothing looks more beautiful than a homestead adorned with growth and the screens of ornamental breakwinds. It also protects the buildings from all weathers. Wind screens should be planted around the out-buildings and along dividing fences, to provide shelter for stock. Very often neglect in the matter of tree planting arises from the lack of knowledge of what to plant, and thus I feel all the more anxious to assist in drawing up a list of trees suitable for ornamental and shade purposes, and which will grow well in this soil and climate. The climatic conditions in this district are very similar to those obtaining on Yorke Peninsula, where the farmers have of late years deemed it necessary to plant breaks, and even in some cases set aside a few acres for a small plantation. These far-sighted persons are now reaping the benefit of such planting, for they have ample timber at their disposal, whilst their neighbors find it unprocurable. The plants most suitable for hedges are the cypressus, which will make a splendid break if planted 6ft. apart, and they may be trimmed to any height desired. Of the three varieties, *lambertiana*, *macrocarpa*, and *horizontalis*, the second is the least expensive. For large wind breaks the tree best suited to this district is the *Pinus halepensis*, or the Aleppo pine, which can be obtained from the Government forest nurseries free of charge. This pine is suited for grouping in large paddocks which are naked of timber, and will materially assist to break the prevailing winds. The trees should be planted about 18ft. apart, and as they are hardy and more easily grown than other pines they should become popular in this district. The Tooart gum is planted freely on Yorke Peninsula, and is easily grown if planted in the late autumn. The young trees are not expensive, and when grown form a good break. For ornamenting the homestead the red flowering gum should be planted more frequently than is the case. They thrive well in our district, and are not injurious to the garden. The trees are of dwarf habit, and will not attain a height of 25ft., even under the most favorable conditions. Farmers who have bees would do well to plant these gums, as they are rich in honey. The *Eucalyptus callophylla* is of a similar type, but is more robust in habit, and grows into a larger tree. The flower is also white instead of red. The English oak should be planted largely, and to look at their best should be placed alternately with evergreen pines. The horse chestnut is of similar habit. The tulip tree is a beautiful deciduous tree, with green leaves similar in size and form to the Oriental plane. The walnut of commerce is one of the finest natural trees, and is very productive. When one sees the time lost in this district in not planting them more frequently one cannot do otherwise than strongly advocate the planting of this specimen—by the acre, if possible. They resist a fair storm, and are easy to grow if strong plants are chosen. Land planted with young walnuts could be used for growing potatoes, chow moellier, &c., until the trees come into bearing. The market for the nuts will be good for many years to come, and they are a sure carried for export."

#### RENDELSHAM.

December 14th.—Present: 17 members.

**SUNFLOWERS.**—In the course of a paper under the heading, "The Value of Sunflowers," Mr. H. A. Stewart said few people were aware of the wholesome qualities of the sunflower as a fodder for stock and poultry. The speaker favored the large Russian variety, which, under favorable conditions, attained a height of 6ft. The seed could be sown during October and November, according to local conditions, through the ordinary grain drill, using every fourth hoe, with 1cwt. of super to the acre. Should the plants grow too closely they could be thinned out and fed to the stock. Good cultivation to keep the weeds in check was essential for the successful raising of the plants. The best time to cut the plants for feeding was when the flowers showed first signs of blooming. For harvesting the seed, the speaker suggested employing a horse and cart, with a sheet spread over the vehicle and fastened to the top rail. Two rails should then be placed across the cart, on which to beat the heads. The writer then explained the actual method of harvesting:—In gathering the seed head, a pair of scateurs were used to sever the ripe seed head from the stalk, which could be placed in a large-mouthed bag suspended from the neck; that, when filled, was emptied into the cart. The harvester seized

a seed head, giving it a few raps on the rail, quickly knocking the seed out. The husk was thrown on the ground, to be eaten by the stock when the threshing was finished.

**AFFORESTATION.**—At a further meeting, held on January 11th, Mr. R. Foster, who contributed a paper on this subject, referred to the huge sums of money paid by the people of Australia in the importation of timber. Continuing, the speaker said it was well known that the natural regeneration of timber was rapidly coming to an end. Most of the good land was being used for cultivation, while the poorer types of soil that would at one time produce good marketable timber were becoming so over-run with vermin that the young trees had no chance of reaching maturity. He believed that the only way to stop the increase in the price of timber and remedy the shortage was for every landholder to plant a few trees every year. Referring to the Rendelsham district, he thought that the Remarkable pine held first place as the most suitable tree for planting; it grew rapidly, made first-class timber, provided excellent shade for stock, and did not harbor destructive birds. On the lower lands many of the gums grew exceptionally well. On some of their land it would only be necessary to securely fence the wood plot, and the trees would grow, after planting, without any further attention. In addition to the commercial value of the trees, they very considerably enhanced the appearance and value of a property. An interesting discussion followed, in which the views of the speaker were indorsed by the members.

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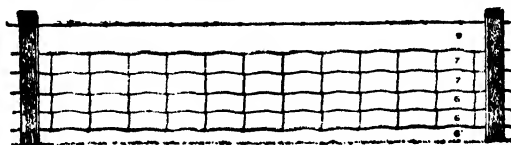


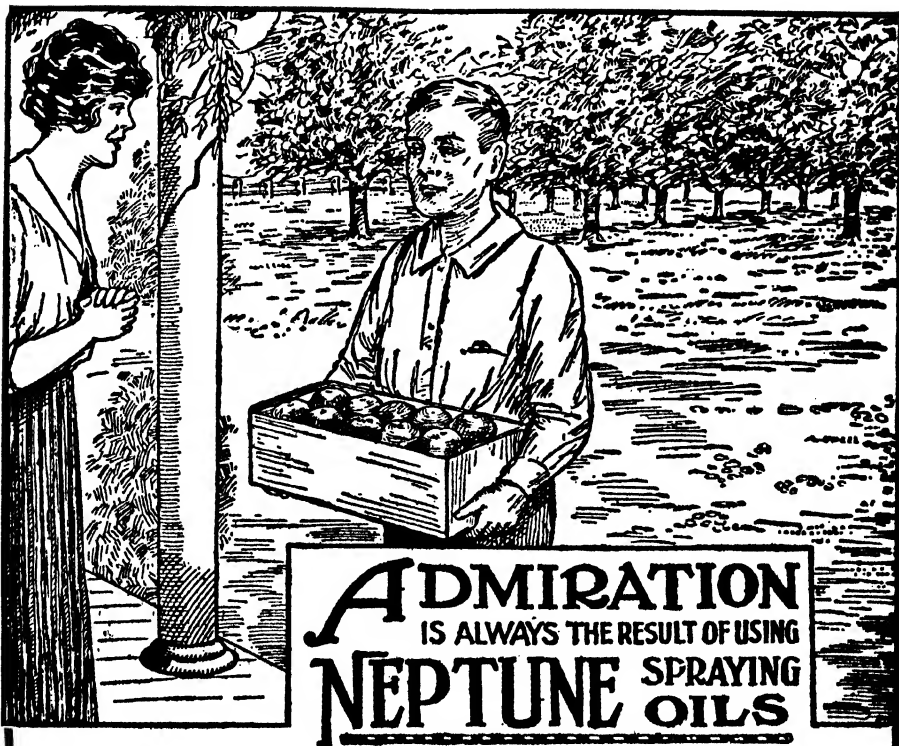
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**All communications to be addressed:**  
**"The Editor, Journal of Agriculture, Victoria Square, Adelaide."**

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T. PASCOE,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### **Fodder Crops for the Cummins District.**

In the Cummins district it is a certainty that live stock carried on sown fodders will eventually play a very important part in the prosperity of the district, and you, as an individual, can do a power of good by always talking fodder crops, and persuading farmers to try different kinds, says the Superintendent of Experimental Work (Mr. W. J. Spafford) in reply to a correspondent. In this connection, see if you can get someone to try Subterranean clover and Wimmera rye grass. The cheapest way to start the former of these fodders is to sow from  $\frac{1}{2}$ lb. to 2lbs. of seed per acre with a cereal crop (hay crop for preference), then shut up the field for a year, or, at all events, only lightly graze it, so as to enable the crop to become well established. This clover will push out the poorer feeds, such as silver grass, &c., and if a good stand is secured, should carry sheep in your district at the rate of four sheep per acre per year. The clover land can be ploughed up and cropped without any fear of killing off the clover, as the seeds are buried in the ground by the plant, and there is always enough seed, even after two crops, to again cover the land. The feeding value of this clover is very similar to that of lucerne, both in the green state and when made into hay. Wimmera rye grass grows well wherever "drake" flourishes, so a farmer in your district could grow this with a certainty. Four pounds or 5lbs. of seed per acre can be sown with cereal crops, or the land can be seeded direct to the crop, using about 10lbs. of seed per acre. Habit of growth is very similar to "drake," but is a good feed and makes fair hay. Anyone with small fields they wish to put down to permanent fodders should get really good results under your conditions, with the following mixture sown in the Autumn:—Wimmera rye grass, 5lbs. to 8lbs.; Subterranean clover, 1lb. to 2lbs.; Black Medic (trefoil), 1lb. to 2lbs.; King Island melilot, 2lbs.

### **Effect of Lime on Sorrell and Sour Land.**

"The application of lime to 'sour' land," says the Superintendent of Experimental Work (Mr. W. J. Spafford), in reply to an inquiry, "corrects the excessive acidity, and so renders it an unsuitable medium for the growth of 'sorrel,' and at the same time makes it more fit for the growing of most of our cultivated crops. Slacked lime does this work of correcting excessive acidity of soils well, and should be applied at the rate of 10cwts. per acre, remembering that the autumn is the best time to apply the lime, and that it should be broadcasted on land that has been cultivated and then harrowed into the soil. Lime of any form should not be ploughed in, but should be incorporated into the top inch or so of the soil. No marked improvement will be noticed in the year of application, but

after the lime has been in the soil for nine or twelve months a wonderful change in the amount of sorrel present will be apparent. As most South Australian soils are deficient in phosphoric acid, it pays to use superphosphate with all crops grown, and even though the land be limed, a dressing of 1cwt. of superphosphate per acre will be of great advantage.

#### Manurial Value of Ashes of Mallee Roots.

A correspondent from the Yeelanna district has submitted the following question, "What is the manurial value of the ashes obtained from the burning of mallee roots?" The Director of Agriculture (Professor Arthur J. Perkins), to whom this matter was referred, says:—"The ashes of mallee roots and shoots have been analysed by the Director of Chemistry (Dr. Hargreaves), with the following results:—

	Roots.	Wood.
Potash ( $K_2O$ ) .....	1.80%	2.42%
Phosphoric acid ( $P_2O_5$ ) .....	0.41%	0.48%
Lime ( $CaO$ ) .....	44.94%	40.90%

"It will be noted that these ashes are valuable chiefly for the amount of lime they bring to the soil; and on soils in the neighborhood of Yeelanna this is an important consideration. The amount of lime present corresponds to about 80 per cent. of very finely crushed pure limestone.

"The potash present is not very great: 1cwt. of ashes would contain about as much potash as is found in 2½lbs. of commercial muriate of potash. Similarly, the phosphoric acid present in 1cwt. of ashes is approximately equal to that present in 2½lbs. of 36 per cent. superphosphate.

"Assuming, therefore, that Yeelanna soils, like those of the bulk of the State, require phosphatic dressings, it is quite impossible to replace superphosphate by mallee root ashes. Their application, on the other hand, would be useful to sour soils lacking in lime at rates of about 10cwt. to the acre. Ashes should not be mixed with superphosphate, but distributed separately on their own account."

### GRAIN GROWERS!

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## DEPARTMENTAL DOINGS.

### GENERAL AGRICULTURE.

During the past month the Director of Agriculture (Professor Arthur J. Perkins) attended the Conference of Mid-Northern Branches at Crystal Brook, and paid a visit to Wood's Point on the River Murray.

On March 7th the Superintendent of Experimental Work (Mr. W. J. Spafford) visited and discussed with the members of the Windsor Agricultural Bureau the matter of laying out local experimental plots.

The Instructor for Mallee Lands (Mr. C. P. Hodge) visited and addressed the following Branches of the Agricultural Bureau:—Coonalpyn, Black Springs, and Tarlee. New settlers in the Tintinara, Nadda, and Coomandook districts were also visited, and advised on matters concerning the working of their blocks.

The Field Officer (Mr. S. B. Opie) visited Messrs. Hunt Bros., Mount Barker, and Mr. J. S. Hammatt, Williamstown, and tendered advice on tobacco growing, &c. Mr. H. Sanders (Yurgo) was interviewed, and arrangements made for conducting experimental plots on that gentleman's farm.

### HORTICULTURE.

The Horticultural Instructor (Mr. Geo. Quinn) visited Kangaroo Island between the 4th and 9th, and inspected lands along the valley of the Cygnet River and reported upon the same relative to their suitability for fruitgrowing. The cotton plots which are being grown at Berri and Barmera under Federal quarantine regulations by the Irrigation and Agricultural Departments were visited, and at Berri an address was given before the local Agricultural Bureau on "Root-galls on Fruit Trees and Vines." Orchards situated around the foothills were visited by request, and advice given on various matters. An address was delivered before the S.A. Fruitgrowers' Association's half-yearly conference at Adelaide entitled "The Present Position of the Fruitgrowing Industry."

### DAIRYING.

The Assistant Dairy Expert (Mr. H. J. Apps) visited and addressed meetings of the Agricultural Bureau at the following centres:—Port Elliot, Ashbourne, Cherry Gardens, Lyndoch, and Williamstown. The Murray Bridge High School was also visited, and a lecture delivered before the scholars entitled "Testing of Milk."

### BUILDINGS, ETC.

On March 4th the Field Engineer (Mr. J. Paull) visited the farms of Messrs. Davis, Jones, Edwards, and Hay, in connection with the proposed erection of general farm buildings. Cowell was visited on the 25th of the month, to discuss with local residents the erection of a butter factory. On the 30th Mr. Paull inspected drainage work under construction on the holdings of Messrs. White, Storr, Mayfield, Giles, and Dawson at Booborowie.

### POULTRY.

The Poultry Expert (Mr. D. F. Laurie) attended the Crystal Brook Conference on March 8th, and on the 29th Mr. W. C. Ayling, of One-tree Hill, was visited, and advised concerning the layout of a new poultry plant.

## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"D.G.L.," Geranium, reports horse with the "staggers." Animal runs round in a circle and falls down, but is able to rise again. There is also a swelling extending along the belly.

Reply—The symptoms described may be due to some brain disorder, or may even be secondary to some digestive disease. Sunstroke is an unusual occurrence except while horses are in work, and is followed by a state of collapse. You should put him in a cool, well-ventilated stable. Give him a dose of laxative medicine, such as a pint of raw linseed oil. Put him on light laxative diet and give him one teaspoonful of saltpetre and 1oz. of Epsom salts in his feed twice a day for a few days.

"N.B.S.," Mount Compass, asks treatment for the knee of a horse that has been "down."

Reply—The treatment of the wound depends largely upon its character. Except in cases requiring special treatment, the following is advised:—Keep the wound clean by washing daily with warm water and washing soda. Use some disinfectant lotion, such as carbolic acid 1 part to 40 of water (one tablespoonful to a pint), to dress the wound after cleansing, and then apply some dry dressing, such as zinc oxide, which should be liberally powdered over the wound. Where the skin has been destroyed, it is replaced by scar tissue. A weak preparation of cantharides will promote the growth of hair, but no application will make hair grow in the absence of hair roots.

"E.A.," Stansbury, has gelding that is continually slobbering. The teeth appear to be sound.

Reply—This is usually a symptom of some irritation of the mouth, disease of teeth, tongue, or lining membrane of the mouth. It is often seen in diseases such as sore throat, in which there is difficulty in swallowing, and occasionally in gastric disorders. You should make a thorough examination of the mouth with a mouth gag. Foreign bodies, such as grass seeds, are a frequent cause of "slobbering" in the horse.

"L.G.W.," Pinnaroo, has four-year-old filly, in poor condition, sluggish, has "tucked up" appearance, and stiff in hind legs.

Reply—She is probably affected with worms. Put her on mash diet for a day or two. Give her a pint of raw linseed oil and two tablespoonfuls of turpentine first thing in the morning on an empty stomach. Observe the effect of this drench and examine faeces for worms. Put her out of work while undergoing treatment with laxative and oil. Supplement her ration with a little crushed oats, and give her a tablespoonful of Fowler's solution of arsenic twice daily in the feed for a fortnight.

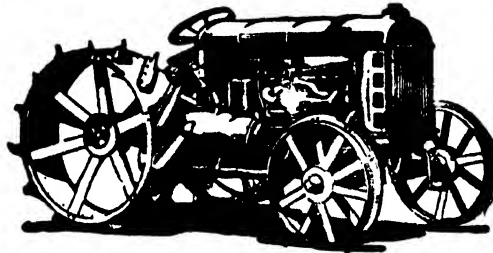
"W.E.H.," Middleton, reports sow which vomits all her food and drink.

Reply—Pigs vomit easily, and this symptom occurs in several diseases. It may be caused by an overloaded stomach, intestinal obstruction, stomach worms, or any form of stomach irritation. In this case it is probably due to gastric catarrh. You



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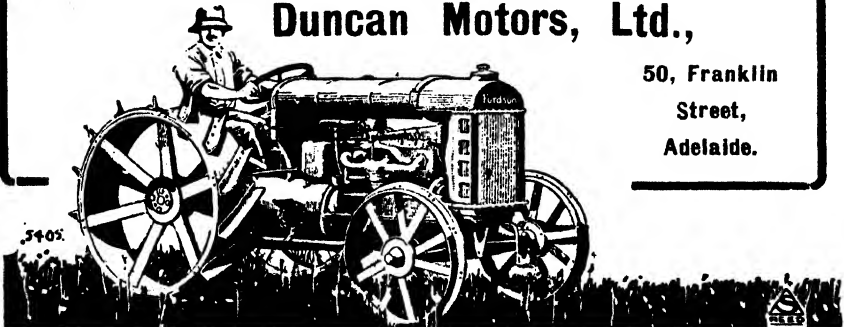
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should feed carefully, giving light, easily-digested food. Give only wholesome food, and see that the food trough, &c., is thoroughly clean. To check the vomiting, give bismuth subnitrate. Obtain half an ounce of this powder. Divide into 12 doses. Give one every four or five hours. If constipated, give calomel 3 grains in 4oz. of castor oil. If you use this purgative do not give any food for 24 hours after the medicine.

“A. F. P.,” Victor Harbor, reports horse very “groggy” in all four legs, and will fall down even when moving about at a walking pace.

Reply—He apparently has subacute laminitis (founder). This often arises from some digestive disturbance, and in this instance may have been caused by the herbage he has been getting. High condition is a predisposing cause. It would be advisable to bring him in and put him on light laxative diet for a week or so. Give him saline medicine, such as Epsom salts 1oz., saltpetre 1 teaspoonful, twice daily in his drinking water. The best treatment while he is tender on his feet would be the water bath. Stand him in cold water up to the fetlocks for two or three hours a day, or longer, if he takes kindly to it. You may look for certain changes in the feet in a month or two, when the hoof will begin to show a characteristic ringed appearance.

“A. S. C.,” Gilles Plains, has cow, with a bladder-like swelling in the vagina about the size of an egg.

Reply—This is probably a cyst, a common form of swelling in the region, and usually having a well-defined neck. You may safely explore the passage as long as you do not exercise any force, and lubricate the hand well before doing so. You will, however, only be able to examine the vagina, which extends forwards about 9in. or 10in. You should not have much difficulty in determining the character of the swelling, which, if about the size of a hen's egg, and attached to the walls of the passage by a constricted neck, you may conclude is a cyst. You can then evacuate it by puncturing it with a clean, sharp knife. It will contain about an ounce of clear or turbid fluid. 2. No; your conclusions in regard to this point are correct. 3. No; the absence of such signs can easily be accounted for, regardless of the swelling.

“W. E.,” Cleve, reports death of two cows. One animal was dry and in prime condition, the other in milk and in fair order. Both cows dribbled from the mouth, eyes sunken, and tongue hanging out. Another cow is in calf and in good condition, but seems paralysed, and has great difficulty in rising.

Reply—The trouble is toxæmia, a disease which may be due to contaminated forage, or which may be induced by cows chewing putrid or decaying animal matter, or bones having fragments of mummified flesh attached. The two cows which died had a more acute form of the disease; the third showed a subacute form. Give her powdered nux vomica, one flat teaspoonful twice daily. Mix this with a little treacle, and give on the tongue. Make an attempt every day to get her to rise, and if she is unable to do so, make her comfortable by sitting her up on her brisket. Put some bedding under her and change her position two or three times a day. In the acute form there is difficulty in swallowing, and any medicine given as a drench is likely to go down the windpipe and set up a form of pneumonia. In this disease medicinal treatment does not give very encouraging results, and prevention is more important. This consists in providing a well-balanced ration, and in the provision of salt and bonemeal, especially at the end of summer. Salt and bonemeal should be given in the feed at the rate of 1oz. of each twice daily. It can also be given as a lick, but many cattle will not take it in this manner. The remains of all animals which die on the farm should be burnt or buried. All food material should be of good quality, and all forage, damaged grain, &c., which is unfit for use, should be destroyed.

## SOME CAUSES OF DEFECTIVE GERMINATION IN WHEAT.

[An address delivered by ARTHUR J. PERKINS, Director of Agriculture, before the 1922 Conference of Mid-Northern Branches.]

The subject of this address has been suggested to me by various inquiries that reached us last season, pointing to very unsatisfactory germination conditions in certain local wheat fields. The seeding season will soon be upon us again, and I have thought that a few remarks on this important subject should not come amiss.

Now, from the general point of view, I think that "good" germination may be said to be governed by the following factors:—

1. The "soundness" and relative youthfulness of the seed itself.
2. The general treatment and handling of the seed prior to seeding operations.
3. Soil conditions, including moisture, temperature, and aeration, during and after seeding operations.

### 1. SOUNDNESS AND AGE OF SEED.

That we should require sound, well-developed seed, free from disease, goes without saying. But what is perhaps less generally known, we require seed comparatively free from harvesting injury. This is a point which I merely mention now in passing, but which I propose dwelling upon at greater length later on.

As to age, other things being equal, there can be no doubt that the best seed is that derived from the preceding harvest. I do not wish to condemn absolutely older seed: indeed, I recognise that well-garnered, carefully-stored two-year-old, or three-year-old, or even four-year-old, seed may prove superior to new seed harvested under unfavorable conditions. In general, however, age does not improve seed, whatever it may do for other things. On the whole, every year that is added to the age of seed of any kind may be said to lead to perceptible loss in germination percentage. You have, no doubt, all heard of wheat grains buried with Egyptian mummies, which are said to have been unearthed in modern times, and when sown to have germinated. When not the consequence of accidental burying of very modern seed, these germinations can generally be traced to the faker and lover of the marvellous, and it is quite unnecessary that we should swallow them whole. Some seed may germinate 20 years and more after harvest; everything depends on the way in which it has been kept, and in this connection the chief essentials to long life are absolute dryness, both in the grain and in its surroundings, and comparatively low temperatures. The following figures quoted by



J. Perceval, for Rothamsted, bear on this point, and should prove of interest:—

TABLE I.—*Showing Germination of Rothamsted Wheat (1880-1906 Harvests) in 1907 (J. Perceval).*

Harvest Year.	Age of Seed. Years.	Germination Percentage.	Harvest Year.	Age of Seed. Years.	Germination Percentage.
1906 . . . . .	1	94	1892 . . . . .	15	29
1905 . . . . .	2	74	1891 . . . . .	16	0
1904 . . . . .	3	3	1890 . . . . .	17	0
1903 . . . . .	4	80	1889 . . . . .	18	0
1902 . . . . .	5	40	1888 . . . . .	19	0
1901 . . . . .	6	99	1887 . . . . .	20	0
1900 . . . . .	7	74	1886 . . . . .	21	18
1899 . . . . .	8	99	1885 . . . . .	22	0
1898 . . . . .	9	38	1884 . . . . .	23	1
1897 . . . . .	10	0	1883 . . . . .	24	0
1896 . . . . .	11	67	1882 . . . . .	25	16
1895 . . . . .	12	57	1881 . . . . .	26	0
1894 . . . . .	13	45	1880 . . . . .	27	0
1893 . . . . .	14	57			

It should be noted that in Table I. the germination percentages are not strictly comparable, since in every case a different wheat, with different original germinating power, is under consideration. Nevertheless, we may notice a gradual loss in germinating power as the age of the seed increases. It is also somewhat remarkable that seed 25 years old should have shown a 16 per cent. germination.

In summary, under this heading we may conclude that for good germination we generally require good sound seed of the preceding harvest; or, if the grain be older, seed that has been thoroughly dried prior to storage, and subsequently protected from all outside moisture.

## 2. GENERAL TREATMENT AND HANDLING OF THE SEED PRIOR TO SEEDING OPERATIONS.

The influence on germination of treatment and handling of seed may be considered under the following headings:—

- (a) Harvesting injury.
- (b) Storage.
- (c) Pickling.

(a) *Harvesting Injury*.—Harvesting injury, which is not always apparent to the casual observer, will vary with circumstances, and particularly with the weather obtaining at harvest time. If we are favored with a characteristically hot, dry December, individual grains are hard and brittle, and what damage is done consists usually in broken grain, which can easily be graded out of a seed sample and fed to live stock. But when heavy rains reach us after the ripening off of the grain, but prior to harvesting, the damage from the point of view of germination is less apparent, but more insidious. Under the influence of abnormal moisture which it absorbs, the grain loses its brittleness; it toughens, does not break, but is none the less injured

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by harvesting machinery. The seed coats may be torn in various positions; the germ itself may be injured; all of which, as we shall see later on, is invariably reflected in a badly germinating wheat field.

Again, rain may fall during harvest, and unless special precautions are taken, or unless a rapid change in weather conditions brings about a quick drying of the grain, partial germination may set in, with a general weakening in the power to germinate when later on the grain is sown as seed.

(b) *Injury to Germination from Defective Storage.*—Similarly, if grain is stored away whilst retaining too great a proportion of internal moisture, or whilst externally moist, its general powers of germination may be weakened. And, in addition, as we all know, it will be liable to weevil attack, which would be equally damaging to germination percentages.

It is to be feared that the general use of complete harvesters—great boon that they have proved to the community—is sometimes responsible for accidents of this kind. By their aid we are able to reap our grain in somewhat greener, and therefore moister, condition than with the old-time stripper; and we place it, moreover, directly in the bag, instead of in the heap, whence the mid-summer sun could be trusted to account for the last drops of superfluous moisture. Green grain gets over-heated, is exposed to weevil, and, as a consequence, often suffers from defective germination.

(c) *Injury to Germination by Pickling.*—Lastly, in the matter of treatment, pickling against bunt may lead to defective germination. As there are only two pickles in common use here, my remarks shall be confined to these, namely, to bluestone and formalin.

*Bluestone.*—We all know that one marked feature of bluestone, or copper sulphate, treatment is to retard germination very appreciably, *i.e.*, unpickled seed usually shows above ground several days ahead of seed pickled with bluestone. Why should this be so? Probably, I think, because the thin coating of copper sulphate which surrounds the grain offers a temporary physical obstacle to the penetration of moisture. It is a well-known fact that if a grain of any kind absorbs moisture from the soil, it is because soil moisture is in ordinary circumstances a very dilute solution. It can also be shown that immersion of grain in very concentrated solutions inhibits the absorption of moisture sufficiently to check the development of the germination process. Hence it may be assumed that at the outset pickled grain, when brought in contact with soil moisture, is more or less surrounded with a concentrated solution, and does not absorb moisture. Gradually, however, the copper sulphate diffuses into the surrounding layers of soil, and the concentration of the solution is reduced proportionately, until ultimately the obstacle to the absorption of moisture is entirely removed, and the grain germinates, but several days later than unpickled grain sown under similar conditions.

In addition, it is a fact of common experience that pickled seed generally shows up thinner in the field than untreated seed; and the natural inference is that bluestone has the power to weaken the germinating powers of seed wheat, or, at all events, to kill off weak grains. It is, too, a matter of observation that this destructive power of the

pickle is apparently more or less proportional to its relative strength; and since it is known that weak solutions are highly toxic towards the spores of bunt, and suffice to protect wheat plants from infection, both in the interests of economy and of the vitality of the seed, we generally recommend a 1 per cent. solution for pickling purposes, *i.e.*, 1lb. of bluestone in 10galls. of water. I notice, however, that in the neighboring States double this strength appears to be usually recommended. In so far as my own observation and experience go, there appears to be no need for this increased strength of pickle.

Why should contact with copper sulphate impair the germination power of wheat grains? And, especially, why should some grains be affected and others not? These two questions admit of being answered in the light of certain recent American investigations. In the first place, it can be shown that in this connection the copper sulphate remains quite innocuous until brought into intimate contact with the germ or embryo of the grain. Normally this embryo is protected by outer coats, which the bluestone cannot penetrate: hence, whilst for reasons already given, it can check, bluestone cannot destroy the embryo's power to germinate. The inference is, therefore, that if in any seed sample treated with bluestone a large proportion of grain fails to germinate, we have indirect presumptive evidence of serious harvest injury.

These facts are clearly brought out by experiments of A. M. Hurd, the results of which have been summarised in Table II.

TABLE II.—*Showing the Influence on Germination of Wheat of a 2½ per Cent. Solution of Bluestone (1lb. to 4galls. of Water), after Immersions of Varying Lengths.*

	Germination 5 Minutes.	After Immersion of— 1 Hour.	6 Hours.
	Per cent.	Per cent.	Per cent.
Seed coats unbroken . . . . .	100	100	100
Seed coats broken over endosperm . . .	100	92	68
Seed coats broken over embryo . . . . .	58	—	—

It should be noted that perfectly sound seed immersed for six hours in a 2½ per cent. bluestone solution still showed a 100 per cent. germination; and we may legitimately infer, therefore, that so long as the seed is sound and uninjured, bluestone pickling does not permanently affect its powers to germinate.

When, on the other hand, the grain is injured over the endosperm, *i.e.*, over the body of the grain, and at distance from the embryo or germ, a short immersion of five minutes is without ill-effects; but when immersion is prolonged for any length of time, germination is progressively affected, presumably because the solution gradually soaks through the endosperm and in time reaches the embryo.

Finally, even five minutes immersion suffices to affect the germination of a large proportion of grains injured over the embryo, whilst prolonged immersion eventually destroys all grain so affected.

What is the explanation of these facts? Firstly, that copper sulphate is a direct poison to the living tissues of the embryo; but that it is without effect on the dead tissues of the endosperm, which is merely an accumulation of baby food for the use of the germinating

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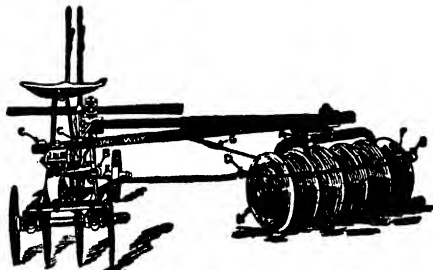
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embryo. Secondly, that the seed coats of the grain, including those protecting the embryo, are apparently what chemists call "semi-permeable membranes," i.e., membranes which permit of the passage of water but not of salts, such as bluestone, which are in solution in the water. Hence it is the embryo-injured grain only that is destroyed by contact with bluestone.

Now let me take some local examples to show how these facts apply in every-day practice.

Last season two farmers, one from the neighborhood of Kadina and the other from that of Mannum, wrote to us complaining of the germination of apparently good seed sown under soil conditions that should have led to good germination. In both instances the seed had been pickled with a 1 per cent. solution of bluestone; and in both instances the field germination was estimated to be not better than 50 per cent. Samples of the pickled seed were in each case sent to us for examination.

These samples were first submitted to a general germination test with the following results:—

	Germination.	
Kadina seed . . . . .	43 per cent.	Equal to 25.8lbs. per bushel
Mannum seed . . . . .	35 per cent.	Equal to 21.0lbs. per bushel

It will be noted that the germination percentages of these samples were exceedingly low—even lower than the rough estimate of field germination.

Subsequently the samples were carefully analysed for harvest injury, with the following results:—

	Kadina Seed.		Mannum Seed.	
	Per-centage.	Lbs. per Bush.	Per-centage.	Lbs. per Bush.
Apparently sound seed . . . . .	32.6	19.6	26.0	15.6
Seed with embryo injury . . . . .	58.0	34.8	65.1	39.1
Seed with endosperm injury . . . . .	9.4	5.6	6.3	3.8
Broken grain, rubbish, &c. . . . .			2.6	1.5
	100.0	60.0	100.0	60.0

Finally, the germinating powers of sound and injured grains were tested separately, with the following results:—

	Kadina Seed.		Mannum Seed.	
	Per-centage.	Lbs. per Whole Bush.	Per-centage.	Lbs. per Whole Bush.
Apparently sound seed . . . . .	53.3	10.4	78.0	12
Seed with embryo injury . . . . .	22.3	7.8	15.4	.0
Seed with endosperm injury . . . . .	—	—	58.5	.2

Now, we may note that in the above analyses and figures, even the apparently sound seed showed relatively low germination, 53 per cent. and 78 per cent. respectively; which goes to show that many grains passed as sound were probably more or less harvest injured. The germination, on the other hand, of grain showing embryo injury was, as might have been expected, very low.

These were not isolated instances last year. I have heard of many others, and have come to the conclusion that we have been given an example of what to expect when harvesting operations are conducted

under abnormally wet conditions. Let us recollect that in a country such as England, in which wet harvests are normal rather than abnormal, 2bush. and 3bush. of wheat to the acre is not an uncommon rate of seeding; and this in spite of the fact that the varieties sown tiller as a rule far more freely than our own varieties, for which 1bush. of seed is usually amply adequate. Why should this be so? It appears to me that we must look for the explanation in the relative toughness of grain harvested under moist conditions. This toughness leads to harvest injury, which, although perhaps without importance from a commercial point of view, is more or less fatal to grain pickled with bluestone and used for seed: Hence, countries suffering from this disability are instinctively driven into the use of abnormally high seeding rates. In normal circumstances, our hot, dry harvesting conditions protect us from this trouble; but whenever we have to face wet harvests, we are exposed to defective germination, as was unquestionably the case last season.

And the remedy? Well, in the first place, after a wet harvest it behoves us to examine carefully our seed wheat with a hand magnifying glass; if we find the proportion of embryo injury to be high, we shall know what to expect. If you, as farmers, feel unable to do this kind of work, you should not hesitate to forward average samples of the seed to us, and we shall be glad to supply you with a full report on it. The next step is more difficult to settle definitely. It is obviously impossible to separate slightly cracked or bruised grain from sound grain, and you may have none other for seed purposes. One obvious remedy--a costly one, it is true--is to sow far more thickly than usual. With badly cracked grain it may be necessary to sow as much as 2bush. to the acre, where one would otherwise have been used.

Fortunately, however, it would appear that formalin pickling does not affect the germination of embryo-damaged grain, providing seeding operations take place soon after treatment, and providing the grain is not allowed to dry unduly, with resulting concentration and dangerous chemical changes in the pickle. Formalin pickling can, therefore, be recommended for seeding seasons which follow wet harvests.

From the general point of view, and in normal seasons, it is tolerably certain that a bushel to the acre of seed is an excessive quantity, and justified only because of the large proportion of grain which, even in normal seasons, fails to germinate. For example, if we assume germination to be perfect, and every grain sown to germinate, 12lbs. to 13lbs. of seed to the acre would give us a wheat plant every 6in. in drills 8in. apart; and, assuming complete weed control, this should be ample for maximum crop returns. Unfortunately, we cannot depend upon these two assumptions. In the first place, every grain sown will not germinate, nor can we check weeds completely. Hence, we are compelled to sow more seed than is actually required. There is, however, no need for us to sow broken grain and rubbish, which can be separated out by graders and fed to live stock, instead of wasting it in the ground; and let us recollect that 35lb. to 40lbs. of good seed will go quite as far as 60lbs. of damaged, indifferent grain.

### 3. INFLUENCE ON GERMINATION OF SOIL AND SURROUNDING CONDITIONS.

It remains for us to consider briefly the influence on germination of soil and general surrounding conditions. The ideal in this connection is represented by conditions leading to incipient germination within 24 hours of seeding. For the purpose we require adequate moisture, adequate temperature, and adequate aeration. In the main, we prepare the way for these conditions in our bare fallowing operations and preparation of the seed bed; but on the whole, they count for little when timely autumn rains are withheld, and particularly when these rains fall too early, say, in March, as was the case last year, and leave the seed bed neither wet nor dry. Seed sown under these conditions leads to what we have come to know as "malting," which, as you know, may result ultimately in a 10 per cent. germination, or possibly in nothing at all. The moisture in the ground may be just sufficient to awaken the dormant grain, but not sufficient to supply the urgent requirements of the tiny seedling rootlets, and the plant generally perishes without showing above ground. Obviously, then, seed should not be sown under these conditions.

Should seed be sown under dry conditions of soil, that is to say, when soil conditions are such as to be without effect upon the grain until rain supervenes? It is a difficult question to answer definitely. The practice has often proved successful; at other times it has failed. Much depends on the character of the season and the extent to which the seed bed has been adequately prepared and is free from the seeds of strong-growing weeds. I should, for example, say that it represents dangerous practice in land infested with soursofs and the like. Nevertheless, it is a practice that is frequently resorted to, and probably rightly so. In some difficult seasons the gamble is justified for a portion of the crop, at all events, in view of the advantages which usually attach to early germinating crops.

In this connection we must recognise that usually under our conditions of climate the most favorable seeding time, that is to say, that time which leads to maximum results, is as a rule very short. In any given season it may be represented by a fortnight, or, again, it may not exceed a week. And, in the circumstances, it certainly behoves us to make the best possible use of this very limited time. Hence, when a farmer has large areas to sow, say, 500 to 600 acres, it has always appeared to me that the practice adopted so successfully by Mr. Both, of Roseworthy, has much to commend it. He always started drilling his superphosphate in February, and was then able to wait patiently for the best seeding time, and then broadcast his seed and cover it at the rate of 80 to 100 acres a day, according to team strength available at the time.

Late seeding is not generally very satisfactory, mainly because it tends to shorten the growing period of the crop by a portion of the year which is of extreme importance to it. Nevertheless, the vagaries of the climate are such that at times late-sown crops are more satisfactory than early ones. From the point of view of germination, the objection to late seeding is that by June and July the temperature of



the surface layers of soil is relatively low, and the germinating grain first, and the young plant next, make unavoidably slow progress. This is particularly the case if heavy rains are more or less continuous.

In summary, it may be said that satisfactory field germination is dependent on original soundness in the seed and its relative youthfulness. Pickling with bluestone should be avoided when seed is known to have suffered severely during harvesting operations, or else the normal seeding rate should be increased considerably, even to the extent of doubling it. The seed itself should, as much as possible, be sown when soil conditions are such as to lead to immediate germination and healthy plant growth; and, apart from essential and timely rainfall, this is very largely dependent upon the care and attention we have bestowed on our fallows in the preceding season.

### IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC.

During the month of February, 1922, 11,497bush. of bananas, 9bush. of grapes, 23bush. of passion fruit, 4bush. of peaches, 2bush. of pears, 677bush. of pineapples, 5,520 bags of potatoes, 13 packages of bulbs, 8 packages of plants, 13 packages of seeds, and 3,017 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910. Of these, 15 empty wine casks were fumigated, and 369bush. of bananas (over-ripe), 9bush. of grapes (prohibited entry), and 1bush. of peaches (no certificate) were destroyed.

Under the Federal Commerce Act, 511 packages of fresh fruit, 378 packages of dried fruit, 540 packages of fruit pulp, 160 packages of onions, and 1 package of seeds were exported to oversea markets. These were consigned as follows:—To London—50 packages of apples, 300 packages of pears, 146 packages of plums, 2 packages of apricots, 4 packages of nectarines, 9 packages of peaches, 540 packages of fruit pulp, 352 packages of dried fruit; to India and East—26 packages of dried fruit, 160 packages of onions, 1 package of seeds. Under the Federal Quarantine Act, 5,841 packages of seeds, &c., were examined and admitted from oversea sources. *Interstate Imports.*—Examined at Mount Gambier, February, 1922—Bananas, 77 packages, 116bush.; pineapples, 4 packages, 6bush.; peaches, 3packages, 3bush.; nectarines, 5 packages, 5bush.; plums, 2 packages, 2bush.; apples, 67 packages, 67bush.; pears, 14 packages, 14bush. Of these, 2bush. of peaches (over-ripe) and seven second-hand cases were destroyed.

## ORCHARD NOTES FOR APRIL.

[By C. H. BEAUMONT, Orchard Instructor.]

Practically all fruit will be picked in this month, except a few very late sorts; even they will be better on the shelves than exposed to frosts.

Put a mark on the trees you intend to take any scions from for grafting; do not forget that careful selection means greater profits and better fruit; this applies equally to vines.

Windfalls should not be allowed to rot on the ground; they are sure carriers of disease, and may be turned to good use if fed to pigs or sheep or other livestock fresh, or if there is too much to use fresh, crush it and dry it, bag it up in wheat sacks, and use as may be required. Good windfalls are bought by evaporators and vinegar makers.

Packers for export must give more attention to the quality of the fruit they handle and the grading if they are to get fair prices. The cases need to be selected, and only strong, even cases used.

If you are intending to extend the orchard, loosen the ground as early as possible, and get the holes open and stakes ready. Oranges should be in not later than this month, and will need protection from the frosts by shading from the rising sun with a bagging screen. Remember to have the young stock fumigated before it leaves the nursery.

Pruning may be commenced as soon as convenient. Do not over prune; better leave a little too much on than take too much out. Leave all the sick trees until the last, and boil the secateurs before putting away.

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## MANURING LUCERNE CROPS.

[By ARTHUR J. PERKINS, Director of Agriculture.]

In certain quarters there is a tendency to look upon lucerne as a crop, the life and productiveness of which can be almost indefinitely prolonged. The connection between this statement and manuring the crop, is the personal observation that many growers begin to think about manuring lucerne when, as a matter of fact, the more rational practice would be to root it up and replace it by some other crop. I do not wish to imply that these remarks necessarily apply to those seeking my advice in this special instance. It is worth emphasising, however, that under our condition of climate, well-handled lucerne is at its maximum producing capacity in the second and third years of its growth, and that thereafter it declines slowly, year by year, and should generally be rooted up in its seventh or eighth year, if not sooner. It is, in fact, extremely rare to find 10-year-old lucerne that is really worth the water that is wasted upon it. It is probably true that from the viewpoint of the general grazier, who handles vast areas of low-unit value, a 10-year-old stand might still appear reasonably good; but, in the eyes of the competent irrigationist, it would do little better than cumber the ground. After all, irrigation water is costly material, and cannot be expected to show a profit except when returns within the neighborhood of the maximum are possible. These remarks apply to lucerne fields that are cut regularly. Needless to add that if they are grazed to any extent, particularly by sheep, the profitable life of the crop will be all the shorter.

All this is by way of introduction to the statement that, apart from cases of exceptional natural fertility, such as obtains on the reclaimed swamps of the Murray, it is idle to expect a long sequence of heavy cuts of lucerne, unless special precautions towards that end are taken from the very outset. This implies far more liberal use of manures than ordinary farming practices have accustomed us to.

What in this connection do regular heavy cuts of lucerne require of the soil? These requirements may be summarised as follows:—

1. An adequate supply of organic matter.
2. A sufficiency of available lime.
3. An abundance of available potash and phosphates.

### ORGANIC MATTER.

Where ordinary cropping is concerned, organic matter is at times rather loosely thought of in terms of the available nitrogen, which it yields upon decomposition, to the exclusion of other factors of immense significance in general soil fertility. Its action on the mechanical condition of soils is invaluable; without it soils would be so much brick dust or loose sea sand. Its undermining influence on other soil constituents is both direct and indirect, and, finally, it represents a reservoir of food materials to the millions of useful bacteria which

swarm in the surface layers of cultivated soils. We know leguminous crops such as lucerne to take their nitrogen mainly from the air through the agency of symbiotic bacteria; and yet experience has long shown that they always thrive best in soils adequately stocked with organic matter; and we must infer that they benefit chiefly from some of the secondary functions of this substance.

I am of the opinion that the organic matter required by a lucerne crop, from which maximum returns are required, should be applied to the soil prior to seeding operations, and not subsequently to the establishment of the crop. If we handle our lucerne crop skilfully we may count upon six to eight years of profitable returns; it would seem, therefore, to be worthy of soil preparation at least equal to that given to an annual crop such as wheat. Hence, I am of the opinion that the seeding of lucerne should be preceded by 10 to 12 months of carefully prepared and well-tilled bare fallow; and it is during the course of the preparation of this bare fallow that requisite quantities of farmyard manure should be carefully incorporated with the soil. This should take place in early winter, so that the inevitable weed-seeds shall have ample time to germinate before the lucerne seed is sown. I suggest that the dressing, the effects of which will spread over six to eight years of intensive cropping, should be not less than 20 tons to the acre, and if this quantity is not available then as much as you can possibly lay hands on.

Personally, I do not favor top dressings of stable manure to an established crop. I recognise, however, that if the pre-seed dressing should have been omitted, such top-dressings may prove financially satisfactory. In the circumstances, I would recommend their winter application in shallow dressings at the rate of five tons to six tons annually.

#### LIME.

An adequacy of available lime is an absolute essential to permanent healthy growth in a lucerne crop, and, fortunately, most of our northern soils in which lucerne might be grown are usually very well stocked with lime. I had almost said that lucerne should not be sown in a soil inadequately supplied with lime. I recognise, however, that there are exceptional cases in which this might still be done with advantage, and for such cases I recommend the following treatment. The lime should be applied annually towards the end of winter and prior to the first summer irrigation at the rate of 4cwts. to 5cwts. to the acre of recently slaked lime, or double that amount of finely crushed limestone or carbonate of lime. The field might be given a touch of the weighted harrows subsequently to the application of the lime.

#### POTASH.

Potash is supposed to be the mineral constituent peculiarly characteristic of most leguminous plants, and of lucerne in particular. Unfortunately it is to-day the most costly form of manure on our markets, although, fortunately, there are few of our soils that are not already abundantly stocked with natural potash. The exceptions are the poorer, lighter types of soils, particularly calcareous sands. But, even

here, if these light soils deficient in potash overlie a good heavy clay, a deep-rooted plant like lucerne will be able to satisfy all its requirements in the subsoil.

But, however abundant potash may be in a soil, it is of comparatively little avail, unless present in mobile and readily available form. Very frequently it is locked up in more or less insoluble combination, and only becomes very slowly available to plant roots; and one frequently finds oneself, so to speak, compelled to bring coals to Newcastle. Fortunately, however, in cases such as these, we are generally able to avoid the purchase of expensive foreign potash manures, and to attack the problem indirectly through the free use of a natural local product—gypsum. Gypsum has the effect of mobilising soil potash and rendering it available to plants. When, therefore, the soil or subsoil is relatively heavy, and potash hunger is suspected—and this would generally be justified when a lucerne crop fails to respond adequately to phosphatic dressings—the lucerne field should be dressed annually with 4cwts. to 5cwts. of gypsum during the winter, and always prior to the first summer irrigation.

#### PHOSPHATES.

Lucerne can no more thrive in the absence of an adequacy of phosphates than wheat, or any other of our crops, and, with a few exceptions, we know our soils to be generally poorly stocked with this constituent. Phosphatic dressings are therefore essential to numerous and heavy cuts; they may, too, be said to be essential to quality in these cuts. Hence I recommend in the first place dressings of 2cwts. to 3cwts. at seeding time, and subsequent annual dressings of 1cwt. applied towards the end of winter and prior to the first summer irrigation. It should be added, of course, that in those soils in which phosphates are already abundantly present in soil or subsoil, there is no need to waste useful money in useless dressings.

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## EXPERIMENTAL FARM HARVEST REPORTS.

### BOOBOROWIE EXPERIMENTAL FARM.

[By E. A. BRISTOW, Manager.]

This farm is situated 120 miles north of Adelaide, and contains 1,344 acres, and has an altitude of 1,200ft. to 2,000ft. It consists of two blocks—one, the old North Booborowie homestead, is "high" land running to the highest point in Brown's Hill Range, and containing 1,046 acres; the other block (No. 478), situated two miles from the homestead, contains 298 acres of comparatively level land, which in times of heavy rains is flooded by water from the Tumela Creek. This farm is situated in the centre of a very good district, which contains land suitable for (1) cereal-growing, (2) lucerne-growing without irrigation, and (3) some really good grazing land not arable. Typical cereal-growing land and grazing land constitute this farm. Unfortunately, it includes none of the first-class lucerne-growing land of which many thousands of acres are to be found in the district,

although in the growing and handling of this crop there is urgent need for experimental investigation.

### THE SEASON 1921.

To the end of March, 4.12in. of rain were registered; that was not of very great value to crops to follow. No rain fell during April, and the first rain recorded in May was 23 points on the 20th, and by the end of the month 247 points were registered. From then to the end of September good rains fell; over 2in. per month. Although a total of 20.50in. of rain was registered for the year, the crops were poor when compared with the majority of years since farming has been conducted here. The intense heat during November was undoubtedly the cause of the low yields of pinched and light grain.

### Rainfall Distribution at Booborowie, 1900-1921.

	Means, 1900- 1914.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	Means, 1900- 1921.
	In.	In.	In.	In.	In.	In.	In.	In.	In.*
January .....	0.45	0.49	0.31	1.33	0.59	0.23	0.22	1.25	0.50
February .....	0.49	—	0.04	0.91	0.52	2.56	—	1.12	0.57
March .....	0.91	—	0.19	1.11	0.62	0.05	0.51	1.75	0.81
April .....	1.01	1.59	0.58	0.30	1.40	1.35	0.79	—	0.96
May .....	1.38	2.37	1.63	4.22	2.10	2.42	0.96	2.47	1.68
June .....	2.39	3.40	4.01	2.31	2.06	2.25	4.27	2.92	2.60
July .....	1.90	1.56	3.36	3.00	1.70	1.36	1.88	2.46	1.99
August .....	1.77	2.22	4.42	4.15	2.99	2.01	3.52	2.38	2.19
September .....	2.14	3.34	1.86	2.25	0.39	2.09	2.57	2.79	2.16
October .....	1.55	1.22	2.41	4.03	1.21	1.44	2.11	1.60	1.69
November .....	1.14	0.25	2.01	0.76	0.13	0.85	3.47	0.84	1.15
December .....	0.86	0.70	1.59	2.33	0.16	1.78	1.92	0.92	1.01
Total .....	15.99	17.14	22.41	26.70	13.87	18.39	22.22	20.50	17.31
"Useful" rainfall (April-November) ..	13.28	15.95	20.28	21.02	11.98	13.77	19.57	15.46	14.42

The total rainfall for the year is high when one takes into consideration that on only four previous occasions since the year 1900 it has been exceeded. The "Useful" rain is considerable, as it is only 53 points below the average annual fall since 1900.

### Distribution of "Useful" Rainfall, Booborowie, 1900-1921.

	1921. Inches.	Means, 1900-21. Inches.
Seeding rains (April-May) .. . . .	2.47	2.64
Winter rains (June-July) . . . . .	5.38	4.59
Spring rains (August-October) . . . . .	6.77	6.04
Early summer rains (November) . . . . .	0.84	1.15
	15.46	14.42

## CROPS.

Through the absence of early seeding rains, the seeding was somewhat delayed, and when rain commenced it was frequently so continuous that it was only with difficulty that progress at seeding could be made. Owing to the excessive wetness of the land at seeding it was difficult to destroy weeds. Some of the barley crops were so rank in growth that they lodged badly, and were difficult to harvest, and a considerable amount of grain was not gathered.

*Ensilage Crop.*—Field No. 12, which was fallowed in 1919 and carried a wheat crop in 1920, was ploughed during March 8th and 9th, 1921, was harrowed on April 2nd and 4th, rolled on the 26th, cultivated on the 27th, and on the 28th was drilled in with 80lbs. of Calcutta oats and 1cwt. super per acre. Harrowed again on June 30th. Although this field was ploughed whilst in a wet condition, and sown early when there was sufficient moisture to germinate all of the seed, and there was plenty of rain during the winter, it made but poor growth at all times of the year. The crop on the whole of the field, an area of 18.66 acres, was cut with the binder, and when chaffed and ensiled yielded 90 tons of ensilage, an average of 4 tons 16cwts. 52lbs. per acre.

*Hay Crops.*—The area devoted to cereals for hay was 47.41 acres. The usual practice of the farm was again followed this year, *i.e.*, some stubble land was sown with oats, and the bulk of the hay was secured from the headlands of fields carrying grain crops. The area of Calcutta oats sown on stubble land in Field No. 5 was 17.35 acres. This was seeded at the rate of 80lbs. and 1cwt. of super per acre. The balance, 30 acres or so, was made up by parts of wheat crops grown on fallowed land, with 75lbs. of seed and 2cwts. of super per acre. The yields of hay secured from the various blocks are set out in the next table:—

*Hay Yields, Booborowie, 1921.*

Kind.	Field Grown.	Area. Acres.	Total Yield.			Yield per Acre.		
	No.		T.	C.	L.	T.	C.	L.
Wheat headlands .. .. .	25	17.44	44	0	0	2	10	51
Wheat headlands .. .. .	6	4.2	12	0	0	2	17	16
Wheat headlands .. .. .	13	6.14	10	0	0	1	12	64
Wheat headlands .. .. .	Exp. plots	2.28	2	0	0	0	17	61
Calcutta oats .. .. .	5	17.35	30	0	0	1	14	61
Farm average .. .. .	—	47.41	98	0	0	2	1	38

The yields obtained cannot be considered very good, considering the quantity of "useful" rain which fell. The oat crop made but poor growth the whole of the season in Field 5. The hay obtained from Field 25 is really very good.



*Hay Returns, Booborowie, 1912-1921.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.			Yield per Acre.		
	In.	In.		T.	C.	L.	T.	C.	L.
1912 . . . . .	15.50	13.20	70.00	132	5	0	1	18	88
1913 . . . . .	15.09	10.88	76.00	109	14	0	1	8	97
1914 . . . . .	9.76	7.79	—	Failure			—		
1915 . . . . .	17.14	15.95	52.27	144	15	0	2	15	43
1916 . . . . .	22.41	20.28	37.93	109	14	0	2	17	94
1917 . . . . .	26.70	21.02	58.43	198	19	0	3	8	11
1918 . . . . .	13.87	11.98	51.41	107	0	0	2	1	70
1919 . . . . .	18.39	13.77	75.75	117	0	0	1	10	100
1920 . . . . .	22.22	19.57	75.64	225	0	0	2	19	55
1921 . . . . .	20.50	15.46	47.41	98	0	0	2	1	38
Means . . . . .	18.16	14.99	—	—			2	2	26

*Oat Crops.*—Only a small area was seeded to oats for grain. All the oats (excepting 5.68 acres) were sown on stubble land, including the crops in rotation-of-crops plots. Field 9B was fallowed in 1919, and carried a wheat crop in 1920, was ploughed between June 4th and 10th, was sown on the 13th with 80lbs. of Calcutta oats and 1cwt. super per acre, and harrowed behind the drill. Scotch Grey oats were sown on fallowed land in Field 25 on May 19th with 80lbs. of oats and 2cwts. of super per acre. Algerian oats were sown on fallowed land in Field 13 on June 20th with 80lbs. of seed and 2cwts. of super per acre. The grain received from the oat crops is shown in the table below, with the total and average return for the season:—

*Oat Yields, Booborowie, 1921.*

Variety.	Field Grown	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Algerian . . . . .	No. 13	1.95	31 37	16 12
Scotch Grey . . . . .	Exp. plots	3.41	61 3	27 6
Calcutta . . . . .	No. 9B	9.72	186 24	19 8
Scotch Grey . . . . .	No. 25	3.64	165 35	45 23
Farm average . . . . .	—	18.72	445 19	23 32

As will be seen from the above table, the Scotch Grey oats on fallowed land (Field 25) is the only crop that yielded really well. The same variety sown on stubble land, with half as much super as the crop on fallowed land, yielded moderately well. The mean yield for oats grown on this farm is now 29bush. 2lbs. per acre for the nine years 1913 to 1921, including the failure of 1914, and this average is to be seen in the following table, with the details of the annual crops.

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*Oat Returns, Booborowie, 1913-1921.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.	Yield per Acre.
	In.	In.		Bush. lbs.	Bush. lbs.
1913 . . . . .	15.07	10.86	54.00	1,394 13	32 11
1914 . . . . .	9.76	7.79	—	Failure	—
1915 . . . . .	17.14	15.95	75.47	2,410 20	31 38
1916 . . . . .	22.41	20.28	4.23	138 33	32 33
1917 . . . . .	26.70	21.02	4.68	231 25	49 20
1918 . . . . .	13.87	11.98	31.93	863 27	27 2
1919 . . . . .	18.39	13.77	22.40	451 18	20 6
1920 . . . . .	22.22	19.57	19.24	843 20	43 34
1921 . . . . .	20.50	15.46	18.72	445 19	23 32
Means . . . . .	18.45	15.19	—	—	29 2

Calcutta oats in Field 9b were very badly damaged by grasshoppers, and were it not for the fact that a quantity had been sold for seed it certainly would have been cut with a binder for hay.

Only two varieties of oats have been grown continuously for the past few years, and the yields under these conditions since 1916 are set out in the next table:—

*Oat Varieties, Booborowie, 1916-1921.*

Year.	Total Rainfall.	"Useful" Rainfall.	Scotch Grey.		Calcutta.	Farm Average.
	In.	In.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.
1916 . . . . .	22.41	20.28	49 21	28 20	32 33	32 33
1917 . . . . .	26.70	21.02	61 20	44 29	49 20	49 20
1918 . . . . .	13.87	11.98	33 19	27 8	27 2	27 2
1919 . . . . .	18.39	13.77	22 24	21 5	20 6	20 6
1920 . . . . .	22.22	19.57	42 30	46 16	43 34	43 34
1921 . . . . .	20.50	15.46	32 8	19 8	23 32	23 32
Means . . . . .	20.68	17.01	40 14	31 8	32 35	32 35

*Barley Crops.*—Other than Field No. 25, all barley was grown on stubble land. The stubbles of Field 23 were ploughed between May 25th and June 23rd, harrowed from June 23rd to June 28th, and a commencement was made with drilling 1bush. Roseworthy Oregon barley and 1cwt. super per acre on the 23rd. Drilling was completed on the 28th. In Field No. 25 a small area of fallowed land was sown with Short Head barley, in order to obtain pure seed. This variety was sown between May 17th and 21st with 50lbs. of barley and 1cwt. super per acre. The barley in this field grew rather rank, and did not lodge, but the heads broke off at the first node. It is doubtful if more than half of the grain was harvested.

Details of this year's barley crops are shown in the next table:—

*Barley Yields, Booborowie, 1921.*

Variety.	Field Grown.	Area. Acres.	Total Yield.	Yield per Acre.
			Bush. lbs.	Bush. lbs.
Roseworthy Oregon . .	No. 23	46.54	1,360 48	29 12
Short Head . . . . .	No. 25	2.89	48 43	16 45
Roseworthy Oregon . .	Exp.	3.09	44 14	15 27
Farm average . . . . .	—	52.52	1,454 5	27 34

This average of 27bush. 34lbs. per acre is fair, considering the bulk of the barley was sown on stubble land, and that the barley on 46.54 acres in Field 23 constituted the third consecutive crop. The table below shows the behavior of barley grown on this farm from 1915 to 1921 :—

*Barley Returns, Booborowie, 1915-1921.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
	In.	In.			
1915 . . . . .	17.14	15.95	3.09	108 26	35 6
1916 . . . . .	22.41	20.28	35.93	1,119 46	31 8
1917 . . . . .	26.70	21.02	23.65	914 26	38 33
1918 . . . . .	13.87	11.98	29.11	1,045 23	35 46
1919 . . . . .	18.39	13.77	32.58	501 1	15 19
1920 . . . . .	22.22	19.57	35.39	1,087 38	30 37
1921 . . . . .	20.50	15.46	52.52	1,454 5	27 34
Means . . . . .	20.18	16.86	—	—	30 33

*Wheat Crops.*—As usual, an assortment of wheat varieties was grown this season, and the effect of this testing of varieties is plainly seen in the table setting out the yields of the different kinds, for the best crop produced a yield of 28bush. 9lbs. per acre, whereas the poorest did not yield higher than 12bush. 47lbs. per acre. The testing of "new" varieties is essentially one of the operations of an experimental farm, but it has the inevitable result of reducing the wheat yields considerably below those that could be expected from proved varieties. All wheat crops were grown on fallowed land, and the fields which carried these crops were treated as follows :—

Field No. 25.—This field carried a wheat crop in 1918, and oats in 1919, was ploughed between July 9th and 17th, 1920, was harrowed twice between August 31st and September 4th, cultivated between September 25th and 29th, cultivated again between November 3rd and 9th, cultivated again between March 12th and 19th, 1921, cultivated between May 16th and 20th, and drilled in with 75lbs. of seed and 2cwts. super per acre between the 17th and 21st. This field was sown in a dry state before any winter rains fell, and, generally speaking, was one of our best fields. Owing to the excessive wetness of the summer months, this field received continuous cultivations in order to destroy the abnormal amount of summer growth.

Field No. 6.—This field carried a wheat crop in 1917, barley and oats in 1918, was in pasture 1919, and ploughed between July 19th and 22nd, 1920, harrowed twice on September 6th, cultivated between October 1st and 4th, cultivated again between October 30th and November 2nd, cultivated between January 3rd and 4th, 1921, cultivated again prior to seeding, and sown on June 16th and 17th with 75lbs. of seed and 2cwts. of super per acre.

Field No. 13.—This field carried wheat in 1918, was grazed 1919, and fallowed between July 28th and August 4th, harrowed twice on September 20th and 21st, cultivated between October 4th and 6th, cultivated between October 21st and 25th, commenced cultivating on January 4th, 1921, and completed on the 5th, cultivated prior to seeding, drilled in with 75lbs. of seed and 2cwts. of super per acre, and harrowed after drilling.

All the fallowed land had to be continuously worked during the 1920-21 summer on account of the abnormal rains, which caused abundant summer growth. The yields of the wheat crops grown as described above, with the total and average yields for the season, will be found in the next table:—

*Wheat Variety Yields, Booborowie, 1921.*

Variety.	Field Grown.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Major . . . . .	No. 6	4.89	137 38	28 9
Yandilla King . . . . .	No. 25	2.18	56 38	25 59
Caliph . . . . .	No. 6	1.36	35 12	25 53
Onas . . . . .	No. 25	7.70	197 46	25 41
Leak's Rustproof . . . . .	No. 25	3.81	89 14	23 25
King's Red . . . . .	No. 13	3.46	79 25	22 57
Minister . . . . .	No. 25	4.98	111 43	22 26
Queen Fan . . . . .	No. 25	3.63	79 9	21 48
Gluyas . . . . .	No. 13	2.01	43 21	21 44
Queen Fan . . . . .	No. 6	1.12	21 20	19 3
Crossbred 53 . . . . .	No. 25	2.42	43 53	18 8
Marshall's No. 3 . . . . .	No. 6	0.82	12 25	15 9
Yandilla King . . . . .	No. 6	0.98	14 20	14 37
Crossbred 53 . . . . .	No. 6	0.67	9 45	14 33
Marshall's No. 3 . . . . .	No. 6	4.21	53 48	12 47
Federation . . . . .	Exp.	24.86	529 55	21 19
Federation . . . . .	Exp.	34.00	597 00	19 52
Farm average . . . . .	—	103.10	2,112 32	20 29

The average wheat yield of 20bush. 29lbs. per acre for a season like 1921 is fair, particularly when it is made up of so many varieties of wheats, some of which have been harvested from a large number of comparatively small plots, and some of the varieties are not the heaviest grain yielders, but on an experimental farm, for various reasons, it is necessary to grow wheats that are not the best yielders. As the table above clearly shows, this average is made up from crops varying in yield from over 28bush. per acre to below 13bush. per acre, and the returns obtained suggest that if only two or three of the best varieties were grown, 25bush. per acre could be averaged, even in a season similar to 1921.

Of the varieties which have yielded above the farm average, Yandilla King and King's Red are old and well-known in most districts. Caliph and Queen Fan are two Roseworthy Agricultural College wheats yielding well and becoming popular in most of the wheat belts in this State. Major and Onas, two comparatively new wheats, yield very heavy crops

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in our "good" cereal districts, and, judging on their behavior on this farm, are well worth a trial. The following table sets out in detail the wheat crops grown each year since 1912, with the mean yield for the period:—

*Wheat Returns, Booborowie, 1912-1921.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.		Yield per Acre.
	In.	In.		Bush. lbs.	Bush. lbs.	Bush. lbs.
1912 . . . . .	15.50	13.20	180.00	4,645 20	25 48	
1913 . . . . .	15.07	10.86	388.75	6,611 53	17 0	
1914 . . . . .	9.76	7.79	339.75	990 58	2 55	
1915 . . . . .	17.14	15.95	284.28	7,765 2	27 19	
1916 . . . . .	22.41	20.28	216.67	7,668 40	35 24	
1917 . . . . .	26.70	21.02	153.22	4,984 30	32 32	
1918 . . . . .	13.87	11.98	173.81	4,631 32	26 39	
1919 . . . . .	18.39	13.77	113.84	3,041 15	26 43	
1920 . . . . .	22.22	19.57	91.51	2,937 17	32 5	
1921 . . . . .	20.50	15.46	103.10	2,112 32	20 29	
Means . . . . .	18.16	14.99	—	—	24 41	

The average yield of 24bush. 41lbs. per acre for the 10-year period is very satisfactory. As will be noted in the above table, seven of the 10 years have been above the average, which clearly shows what a reliable cereal-growing district this is, particularly when compared to most of our other districts.

The results secured from some of our main wheats for the past nine years are to be found in detail below:—

*Yields of Wheat Varieties, Booborowie, 1913-1921.*

Variety.	Means, 1913-1915.	1916.	1917.	1918.	1919.	1920.	1921.	Means, 1916-1921.	Means, 1918-1921.
	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.
Onas . . . . .	—	35 54	44 44	26 23	24 52	38 23	25 41	32 40	28 49
Yandilla King . . . .	16 41	36 46	28 37	31 49	30 28	41 8	25 59	32 28	32 21
Federation . . . . .	21 23	46 51	34 36	27 51	26 29	31 12	19 1	31 0	26 8
Queen Fan . . . . .	*35 46	29 17	34 27	25 50	24 6	35 13	21 9	28 20	26 34
Caliph . . . . .	—	27 38	25 21	21 26	31 14	33 27	25 53	27 30	28 0
Marshall's No. 3 . . .	15 42	32 16	27 6	28 6	29 26	33 38	13 10	27 17	26 5
Gluyas . . . . .	16 12	15 19	34 13	25 18	31 15	31 58	21 44	26 38	27 34
King's Red . . . . .	17 42	27 58	28 15	18 2	23 53	35 15	22 57	26 3	25 02
Minister . . . . .	—	—	—	34 6	26 54	34 38	22 26	—	29 31
Leak's Rustproof . . .	—	—	—	24 0	29 39	29 4	23 25	—	26 32
Crossbred 53 . . . . .	—	—	—	25 8	21 9	28 59	17 21	—	23 9
Major . . . . .	—	—	—	—	31 47	46 14	28 9	—	—

\* 1915 only.

As will be seen in the above, since 1916 Yandilla King and King's Red are in the lead; Minister is proving a good variety also. Major for the three years 1919-1921 gives an average of 35bush. 3lbs. per acre, and there is every reason to believe it is going to prove one of the best varieties, although the period of three years' trial is too short to form an opinion. Onas is also another good variety in districts with a good rainfall and heavy clay soils.

## PERMANENT EXPERIMENTAL PLOTS.

Instead of placing experimental plots in different fields each year, the policy of permanent plots has been adopted, with the idea of eliminating residual effects of fertilisers or previous soil treatments.

## BARE FALLOW-WHEAT EXPERIMENTS.

Various series of permanent experiments dealing with wheat on bare fallow-wheat rotation, and covering manurial, cultivation, and depth of ploughing tests, were mapped out in 1915. The plots carried their first crops in 1916. The plots are so arranged that one-half of each is fallowed each alternate year, the half fallowed one year carrying a crop the following year, and *vice versa*. For the six seasons that these plots have been cropped, Federation wheat has been used on all plots.

*Permanent Manurial Plots, Booborowie, 1916-1921.*

Yield per Acre.

Plot.	Manuring per Acre. *	1916.		1917.		1918.		1919.		1920.		1921.		Means, 1916-21.
		B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.
1	½cwt. superphosphate . . .	36	58	28	23	23	28	26	50	30	11	11	52	26 17
2	1cwt. superphosphate . . .	38	57	28	14	34	27	29	3	29	52	13	45	29 3
3	2cwts. superphosphate . . .	39	3	30	5	40	50	28	16	28	31	19	40	31 4
4	3cwts. superphosphate . . .	38	0	29	20	41	4	30	39	32	6	18	39	31 38
5	No manure . . . . .	32	58	27	39	24	24	17	32	23	29	5	25	21 54
6	1cwt. super., ½cwt. nitrate of soda (spring) . . . .	40	18	34	50	35	38	27	34	32	56	18	17	31 35
7	2cwts. super., ½cwt. nitrate of soda (spring) . . . .	40	50	34	36	36	33	31	35	32	5	19	14	32 29
8	1cwt. super., ½cwt. sulphate of ammonia (seeding) . .	41	25	31	18	32	33	28	53	33	39	17	22	30 51
9	2cwts. super., ½cwt. sulphate of ammonia (seeding) . .	38	11	36	13	34	28	29	33	30	48	21	21	31 46
10	1cwt. super., ½cwt. muriate of potash (seeding) . . .	40	50	32	31	34	44	28	9	28	44	12	13	29 32
11	2cwts. super., ½cwt. muriate of potash (seeding) . . .	44	1	30	54	34	41	29	0	29	20	19	26	31 14
12	2cwts. super., ½cwt. muriate of potash (seeding), ½cwt. nitrate of soda (spring) . . . . .	40	34	34	28	36	31	29	7	30	8	19	58	31 48
13	1cwt. superphosphate . . .	40	11	34	35	34	18	25	58	29	36	17	6	30 17
14	No manure . . . . .	40	9	28	31	24	36	14	6	21	9	3	9	21 57
15	1cwt. basic slag . . . . .	41	55	34	14	28	49	22	26	28	30	21	47	29 37
16	2cwts. basic slag . . . . .	42	23	39	43	28	10	27	47	29	22	21	46	31 32
17	10 tons farmyard manure .	40	7	31	26	28	25	28	8	29	49	12	5	28 20
18	10 tons farmyard manure, 2cwts. super. . . . .	41	44	32	41	32	40	32	17	28	43	21	0	31 31
19	10 tons farmyard manure, 2cwts. super., ½cwt. mur- iate of potash . . . . .	42	5	31	56	32	0	32	12	33	34	20	16	32 0
20	2cwts. super., 4cwts. gypsum . . . . .	41	8	31	36	33	12	29	13	28	43	20	29	30 43
21	2cwts. super., 5cwts. lime .	45	58	35	38	31	3	29	36	29	15	19	51	31 53
22	2cwts. super. (half at ploughing) . . . . .	40	40	32	18	30	16	28	52	28	59	18	44	29 58
23	2cwts. super. (half at ploughing), ½cwt. nit- rate of soda . . . . .	41	31	32	20	31	55	28	3	31	20	18	40	30 38



These manurial tests with wheat have been conducted incessantly for the past six seasons, and in such a series of seasons, and in these particular soil conditions, they appear to evince for Booborowie Experimental Farm as follows:—

1. A  $\frac{1}{2}$  cwt. dressing of superphosphate gives an increase of 4bush. 22lbs. of wheat per acre over and above the yield received from wheat grown without manure.

2. A dressing of 1cwt. superphosphate gives an increased yield of 7bush. 45lbs. per acre.

3. A 2cwt. application of superphosphate gives an increase of 9bush. 9lbs. per acre.

4. A 3cwt. application of superphosphate gives an increase of 9bush. 43lbs. per acre.

5. A dressing of 1cwt. superphosphate gives an increase of 2bush. 46lbs. over and above that received from a  $\frac{1}{2}$  cwt. dressing superphosphate.

6. A dressing of 2cwts. superphosphate gives an increase of 4bush. 47lbs. over a  $\frac{1}{2}$  cwt. dressing.

7. A dressing of 3cwts. superphosphate gives an increase of 5bush. 21lbs. over a  $\frac{1}{2}$  cwt. dressing.

8. A dressing of 2cwts. superphosphate gives an increase of 1bush. 24lbs. over and above that received from a dressing of 1cwt. superphosphate.

9. A dressing of 3cwts. superphosphate gives an increase of 1bush. 58lbs. over a 1cwt. application.

10. A 3cwt. dressing of superphosphate gives an increase of 34lbs. over and above that received from a 2cwt. application of superphosphate.

11. An application of 1cwt. basic slag gives an increase of 7bush. 42lbs. over the no-manure plots.

12. An application of 2cwts. basic slag gives an increase of 9bush. 37lbs. over the no-manure plots.

13. A 2cwt. dressing of basic slag gives an increase of 1bush. 55lbs. over a 1cwt. application of basic slag.

14. The addition of  $\frac{1}{2}$  cwt. nitrate of soda to a dressing of 1cwt. superphosphate gives an increase of 1bush. 55lbs. per acre.

15. The addition of  $\frac{1}{2}$  cwt. nitrate of soda to a dressing of 2cwts. superphosphate gives an increase of 1bush. 25lbs.

16. An application of  $\frac{1}{2}$ cwt. sulphate of ammonia added to 1cwt. superphosphate gives an increase of 1bush. 11lbs.

17. An application of  $\frac{1}{2}$ cwt. sulphate of ammonia added to a 2cwt. dressing of superphosphate gives an increase of 42lbs. per acre.

18. A  $\frac{1}{2}$ cwt. dressing of muriate of potash in addition to 1cwt. superphosphate gives a loss in yield of 8lbs. per acre.

19. A  $\frac{1}{2}$ cwt. dressing of muriate of potash in addition to 2cwts. superphosphate gives an increase in yield of only 10lbs. of wheat per acre.

20. The addition of  $\frac{1}{2}$ cwt. muriate of potash and  $\frac{1}{2}$ cwt. nitrate of soda to 2cwts. superphosphate gives an increase of 44lbs. per acre. The addition of  $\frac{1}{2}$ cwt. muriate of potash gives no extra yield over the superphosphate and nitrate of soda. The addition of  $\frac{1}{2}$ cwt. nitrate of soda gives an increase of 34lbs. over the superphosphate and muriate of potash dressing.

21. Ten tons of farmyard manure per acre gives an increase of 6bush. 25lbs. of wheat over no manure, at a minimum cost of £4 for the fertiliser.

22. Ten tons of farmyard manure and 2cwts. of superphosphate per acre only gives an increase of 27lbs. of wheat more than that received from a dressing of 2cwts. superphosphate alone. The addition of  $\frac{1}{2}$ cwt. muriate of potash to 2cwts. superphosphate and 10 tons farmyard manure only increases the yield by 29lbs. of wheat per acre.

23. The addition of 4cwts. gypsum to the dressing of 2cwts. superphosphate gives no increase to the wheat crop.

24. The addition of 5cwts. lime to a dressing of 2cwts. superphosphate gives an increase of 49lbs. per acre at a minimum extra cost of 8s. for lime.

25. Putting half of the superphosphate into the land at ploughing time, and at the depth of ploughing, does not give an increase over the method of putting all of the superphosphate in with the seed, when 2cwts. superphosphate is used to the acre.

26. The addition of  $\frac{1}{2}$ cwt. nitrate of soda to 2cwts. superphosphate, when half of the latter fertiliser is put in the soil at ploughing time, only gives an increase of 40lbs. of wheat per acre.

#### MONEY VALUE OF INCREASES.

Owing to the varying prices of both grain and fertilisers, it is quite impossible to put a correct money value on the increases secured from different fertilisers, but if we take figures about 25 per cent. in advance

of pre-war prices we can get a comparison of the above results as shown below. In the table below the prices used to arrive at the values of grain increases are:—

	<i>s. d.</i>
Wheat . . . . .	3 9 per bush.
Superphosphate . . . . .	5 0 per cwt.
Basic slag . . . . .	5 0 per cwt.
Nitrate of soda . . . . .	18 0 per cwt.
Sulphate of ammonia . . . . .	16 0 per cwt.
Muriate of potash . . . . .	18 0 per cwt.
Farmyard manure . . . . .	8 0 per ton
Gypsum . . . . .	2 0 per cwt.
Lime . . . . .	32 0 per ton

Addition of—	To—	Gives Increase of—	Increase at 3s. 9d. per Bush.	Cost of Extra Outlay.	Profit per Acre.
		<i>B. L.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
$\frac{1}{2}$ cwt. super. . . . .	No manure . . . . .	4 22	16 5	2 6	13 11
1cwt. super. . . . .	No manure . . . . .	7 45	29 1	5 0	24 1
2cwts. super. . . . .	No manure . . . . .	9 9	34 4	10 0	24 4
3cwts. super. . . . .	No manure . . . . .	9 43	36 5	15 0	21 5
$\frac{1}{2}$ cwt. super. . . . .	$\frac{1}{2}$ cwt. super. . . . .	2 46	10 5	2 6	7 11
$1\frac{1}{2}$ cwts. super. . . . .	$\frac{1}{2}$ cwt. super. . . . .	4 47	17 11	7 6	10 5
$2\frac{1}{2}$ cwts. super. . . . .	$\frac{1}{2}$ cwt. super. . . . .	5 21	20 1	12 6	7 7
1cwt. super. . . . .	1cwt. super. . . . .	1 24	5 3	5 0	0 3
2cwts. super. . . . .	1cwt. super. . . . .	1 58	7 5	10 0	Loss
1cwt. super. . . . .	2cwts. super. . . . .	0 34	2 2	5 0	Loss
1cwt. basic slag . . . . .	No manure . . . . .	7 42	28 11	5 0	23 11
2cwts. basic slag . . . . .	No manure . . . . .	9 37	36 1	10 0	26 1
1cwt. basic slag . . . . .	1cwt. basic slag . . . . .	1 55	7 2	5 0	2 2
$\frac{1}{2}$ cwt. nitrate of soda . . . . .	1cwt. super. . . . .	1 55	7 2	9 0	Loss
$\frac{1}{2}$ cwt. nitrate of soda . . . . .	2cwts. super. . . . .	1 25	5 4	9 0	Loss
$\frac{1}{2}$ cwt. sulphate of ammonia . . . . .	1cwt. super. . . . .	1 11	4 5	8 0	Loss
$\frac{1}{2}$ cwt. sulphate of ammonia . . . . .	2cwts. super. . . . .	0 42	2 8	8 0	Loss
$\frac{1}{2}$ cwt. muriate of potash . . . . .	1cwt. super. . . . .	*—	—	9 0	Loss
$\frac{1}{2}$ cwt. muriate of potash . . . . .	2cwts. super. . . . .	0 10	0 8	9 0	Loss
$\frac{1}{2}$ cwt. muriate of potash and $\frac{1}{2}$ cwt. nitrate of soda . . . . .	2cwts. super. . . . .	0 44	2 9	18 0	Loss
$\frac{1}{2}$ cwt. muriate of potash . . . . .	2cwts. super. and $\frac{1}{2}$ cwt. nitrate of soda . . . . .	†—	—	9 0	Loss
$\frac{1}{2}$ cwt. nitrate of soda . . . . .	2cwts. super. and $\frac{1}{2}$ cwt. muriate of potash . . . . .	0 34	2 2	9 0	Loss
10 tons farmyard manure . . . . .	No manure . . . . .	6 25	24 1	80 0	Loss
10 tons farmyard manure . . . . .	2cwts. super. . . . .	0 27	1 8	80 0	Loss
$\frac{1}{2}$ cwt. muriate of potash . . . . .	10 tons farmyard manure and 2cwts. super. . . . .	0 29	1 10	9 0	Loss
4cwts. gypsum . . . . .	2cwts. super. . . . .	†—	—	8 0	Loss
5cwts. lime . . . . .	5cwts. lime . . . . .	0 49	3 1	8 0	Loss

\* 8lbs. decrease.

† 41lbs. decrease.

‡ 21lbs. decrease.

*Permanent Cultivation Plots, Booborowie, 1916-1921.*

All plots dressed with 2cwts. superphosphate per acre.

Plot.	Treatment.	Yield per Acre.						Means,	
		1916.	1917.	1918.	1919.	1920.	1921.	1916-21.	
		B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	
24.	Ploughed 6in. deep and harrowed within a few days. Cultivated or harrowed whenever weeds or a crust render necessary ..	40 48	31 33	31 44	28 30	30 29	19 14	30 23	
25.	Ploughed 6in. deep, and left rough throughout the winter. Cultivated or harrowed whenever weeds or a crust render necessary .. . . . . .	41 4	35 52	33 56	28 45	29 19	19 30	31 24	
26.	Ploughed 6in. deep, and rolled within a few days, and cultivated or harrowed according to circumstances. Cultivated or harrowed whenever weeds or a crust render it necessary .. .	33 25	33 14	29 34	27 31	28 26	20 40	28 48	
27.	Ploughed 6in. deep, and skim-ploughed after first rain. Cultivated or harrowed whenever weeds or a crust render necessary .. . . . . .	41 1	33 47	32 24	25 53	27 57	19 27	30 5	
<i>Late Fallow (September).</i>									
28.	Ploughed 3in. deep and cultivated according to requirements, but not rolled .. . . .	35 38	32 29	31 28	26 25	29 6	17 15	28 43	
29.	Ploughed 6in. deep and heavily rolled the same day as ploughed. Cultivated according to requirements. . . . .	37 45	30 56	31 25	26 39	28 46	16 34	28 41	
<i>Autumn Ploughing (March or April).</i>									
30.	Not bare-fallowed, but ploughed 4in. deep, and immediately rolled. Cultivated according to requirements. . . . .	35 49	24 3	28 12	17 58	26 30	9 29	23 40	

*Permanent Depth of Ploughing Plots, Booborowie, 1916-1921.*

All plots dressed with 2cwts. superphosphate per acre.

Plot.	Depth of Ploughing.	Yield per Acre.						Means,	
		1916.	1917.	1918.	1919.	1920.	1921.	1916-21.	
		B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	
31.	Ploughed 3in. deep .. . . .	40 2	28 20	33 38	27 25	28 23	19 56	29 37	
32.	Ploughed 6in. deep .. . . .	37 26	31 24	32 42	27 1	28 50	21 24	29 48	
33.	Ploughed 9in. deep .. . . .	33 54	33 17	32 23	27 20	29 19	20 44	29 29	
34.	Ploughed 9in. deep (to be then twice ploughed 3in. deep before again being ploughed 9in.) ..	33 44*	—	30 35†	—	29 34†	—	29 4	
		—	32 13*	—	27 36†	—	20 44†		

\* 9in. ploughing.

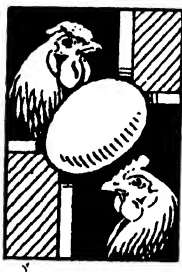
† 3in. ploughing.

# MORE EGGS FROM SAME HENS

IF YOU USE

## Karswood Poultry Spice

IT DOES NOT FORCE THE BIRDS.



Karswood Poultry Spice (containing ground insects) has been proved by poultry experts to be absolutely non-injurious, and a valuable NATURAL egg producer at all periods of the year.

Karswood contains no cayenne pepper, chillies, gentian, or other injurious ingredients. It stimulates egg production by a natural development of the egg cluster.

Read one of the many spontaneous testimonials we receive:—

9, Austral Terrace, Malvern, South Australia.

Dear Sir—I would like to inform you of the results I have obtained from using Karswood Poultry Spice. After using it for a fortnight you could see a wonderful improvement in the condition and the plumage of the birds, it having considerably assisted them through the moult, and actually started them laying in the middle of it. After using several packets of Karswood, and when my fowls were laying heavily, I decided to leave off Karswood, but after a few weeks my eggs decreased 50 per cent. I again decided to test the qualities of Karswood, and am glad to say that after a few days' use my fowls were again laying heavily.

(Sgd.) **WALLIE R. ROBINSON.**

### NOTE THE ECONOMY—

4d. packet supplies .. .. .	12 hens one week.
1s. packet supplies .. .. .	20 hens 16 days.
2s. packet supplies .. .. .	20 hens 32 days.
7lb. tin (14s.) supplies .. .. .	140 hens 32 days.

Half-penny a day to make 12 lay.

One tablespoonful (4oz.) of Karswood Poultry Spice (containing ground insects) is sufficient for 20 hens for one day. So that it costs you less than a half-penny per day for every dozen fowls.

### TRY A 1s. PACKET.

Ask your Poultry Food dealer to supply you with a 1s. packet of Karswood Poultry Spice (containing ground insects), and try it for a fortnight on half-a-dozen hens. Results are not instantaneous—it takes a fortnight or three weeks to improve the egg return. If your local dealer cannot supply you, send a postcard to the Karswood Agent for your State (address below), asking the name of the nearest dealer who can supply you.

### AUSTRALIAN AGENTS:—

New South Wales: Coastal Farmers' Co-op. Society, Ltd., Quay Street, SYDNEY.  
 Queensland: Farmers' Co-operative Distributing Co., Turbott Street, BRISBANE.  
 Victoria and Tasmania: Henry Berry and Co., Pty., Ltd., Collins Street, MELBOURNE.  
 South Australia: South Australian Milling and Trading Co., Ltd., Baker Street, ADELAIDE.  
 West Australia: Westralian Farmers' Ltd., Wellington Street, PERTH.

**KARSWOOD POULTRY SPICE DOES NOT FORCE THE BIRDS.**

The tests, comparing different methods of cultivating land for wheat-growing, show, where the same variety of wheat and the same manuring are used at Booborowie, that, for a series of seasons such as the past six:—

1. Bare fallowing the land early or late, and any subsequent method of cultivation, increases the yield above non-fallow to the extent of from 5bush. 2lbs. to 7bush. 24lbs. per acre.

2. The biggest returns are obtained from fallowed land prepared according to the recognised practice of the district, *i.e.*, ploughing early (July), leaving rough throughout the winter, then cultivating or harrowing whenever weeds or a surface crust render it necessary.

3. Harrowing the land immediately after ploughing appears to have a depressing effect to the extent of about 1bush. per acre in the yield.

4. The rolling immediately after "early" ploughing (July) appears to have a depressing effect on the yield to the extent of over 2½bush. per acre.

5. Skim ploughing the fallowed land after the first rain does not increase the wheat crop above the yield received from ordinary fallow working.

6. Land ploughed in July in preparing the bare fallow gives an increase of 1bush. 28lbs. per acre over the yield received from land ploughed in September.

7. September ploughing gives about equal yields whether ploughed shallow (3in.) and not rolled, or ploughed deep (6in.) and heavily rolled the same day.

8. The depth to which land is ploughed between 3in. and 9in. has but little effect on the yields of wheat crops in this locality up to the present.

9. With special reference to Plots 24 and 26, it is mentioned that in this neighborhood it is difficult, and frequently impossible, to keep fallow land loose and mellow on the surface, owing to the high percentage of clay present. The tendency is for the soils to run together like cement; therefore harrowing and rolling immediately after ploughing does not assist in remedying this difficulty, which is evinced by the decreased yields. On lighter soils, however, harrowing and rolling immediately after ploughing would have a beneficial effect.

#### ROTATION OF CROPS.—EXPERIMENTAL PLOTS.

Several series of permanent experimental plots were mapped out in 1915, and all of these have been continued since that time. The field chosen for the rotation plots was fortunately bare fallowed in 1914, so that crops and records for these crops commence from that year. As

the series of rotations covering a comparatively long period of time have not yet completed a cycle, it is hardly possible to interpret the results secured, and this will be so for a few more years.

*Rotation Plots, Booborowie, 1915-1921.*

	1915.	1916.	1917.	1918.	1919.	1920.	1921.	Means,
	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.	1915-21.
								B. L.
SERIES I.—Plots 1 and 2.								
<i>Bare fallow—Wheat (2cwts. super.).</i>								
Wheat ..	29 42	30 28	32 22	23 10	23 5	28 9	24 0	27 17
SERIES II.—Plots 3 and 4.								
<i>Sorghum—Wheat (2cwts. super.).</i>								
Wheat ..	34 44	31 20	31 50	19 49	24 37	31 50	16 37	27 16
SERIES IIIA.—Plots 5 to 7.								
<i>Pasture—Bare Fallow—Wheat (no manure).</i>								
Wheat ..	29 5	28 45	25 40	15 40	20 6	22 17	16 44	22 37
SERIES IIIB.—Plots 8 to 10.								
<i>Pasture—Bare Fallow—Wheat (<math>\frac{1}{2}</math> cwt. super.).</i>								
Wheat ..	37 9	37 47	35 10	26 5	29 53	35 54	23 14	32 10
SERIES IIIC.—Plots 11 to 13.								
<i>(1 cwt. super.).</i>								
Wheat ..	38 51	39 17	36 6	27 56	28 28	35 51	22 36	32 43
SERIES IIID.—Plots 14 to 16.								
<i>Pasture—Bare Fallow—Wheat (2cwts. super.).</i>								
Wheat ..	37 6	39 30	36 48	23 55	28 41	33 1	23 43	31 49
SERIES IIIE.—Plots 17 to 19.								
<i>Pasture—Bare Fallow—Wheat (2cwts. super.).</i>								
Wheat ..	39 40	40 0	32 58	25 43	27 26	32 17	25 1	31 43
SERIES IVA.—Plots 20 to 22.								
<i>Bare Fallow—Wheat (2cwts. super.)—Barley (1 cwt. super.).</i>								
Wheat ..	37 37	43 40	38 33	27 6	25 13	33 23	22 22	32 33
Barley ..	27 47	26 27	18 5	27 17	1 18	20 13	15 45	19 33
SERIES IVB.—Plots 23 to 25.								
<i>Bare Fallow—Wheat (2cwts. super.)—Oats (1 cwt. super.).</i>								
Wheat ..	34 0	42 25	41 52	28 18	26 26	38 6	20 27	33 2
Oats ..	31 9	33 23	45 32	43 18	14 30	42 32	34 8	34 56
SERIES IVc.—Plots 26 to 28.								
<i>Bare Fallow—Wheat (2cwts. super.)—Peas (1 cwt. super.).</i>								
Wheat ..	36 23	42 41	39 37	24 2	28 39	37 24	20 41	32 47
SERIES IVd.—Plots 29 to 31.								
<i>Bare Fallow—Wheat (2cwts. super.)—Rape (1 cwt. super.).</i>								
Wheat ..	31 35	44 54	45 27	23 11	24 16	35 20	21 3	32 15
SERIES V.—Plots 32 and 33.								
<i>Bare Fallow—Wheat (2cwts. super.).</i>								
Wheat ..	34 52	44 47	38 44	29 31	22 18	33 40	24 51	32 40
SERIES VIA.—Plots 34 to 37.								
<i>Pasture—Bare Fallow—Wheat (2cwts. super.)—Oats (2cwts. super.).</i>								
Wheat ..	35 1	49 5	37 56	27 19	27 24	33 12	19 57	32 51
Barley ..	41 7	34 16	27 43	37 28	14 5	24 1	14 49	27 38

*Rotation Plots, Booborowie, 1915-1921—continued.*

## SERIES VIb.—Plots 38 to 41.

*Pasture—Bare Fallow—Wheat (2cwt. super.)—Oats (2cwt. super.).*

Wheat . .	35 49	48 42	39 25	28 54	28 11	36 57	22 52	34 24
Oats . .	40 20	23 5	43 24	41 3	12 13	38 27	19 21	31 8

## SERIES VII.—Plots 42 to 46.

*Bare Fallow—Wheat and Lucerne (2cwt. super.)—Lucerne—Lucerne—Lucerne.*

Wheat . .	33 37	33 47	41 37	33 30	28 1	36 40	22 7	32 46
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## SERIES VIII.—Plots 47 to 50.

*Bare Fallow—Wheat and Rye Grass (2cwt. super.)—Rye Grass—Rye Grass.*

Wheat . .	22 0	47 30	32 45	25 26	23 45	32 19	21 7	29 16
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*Grazing Crops in Rotation Plots.*

	Sheep per Acre per Year.					Means, 1917-21.
	1917.	1918.	1919.	1920.	1921.	
SERIES II.—						
Sorghum . . . . .	2.90	2.13	5.43	4.59	3.68	3.75
SERIES IIIA.—						
Pasture after wheat without manure . . . . .	0.89	0.57	2.61	4.21	3.90	2.44
SERIES IIIB.—						
Pasture after wheat with ½wt. superphosphate . . .	1.28	0.99	2.61.	3.60	4.15	2.53
SERIES IIIC.—						
Pasture after wheat with 1wt. superphosphate . . .	0.85	1.29	2.09	3.60	5.47	2.66
SERIES IIID.—						
Pasture after wheat with 2cwt. superphosphate . . .	1.55	0.99	2.46	3.79	5.31	2.82
SERIES IIIE.—						
Pasture after wheat with 3cwt. superphosphate. . .	1.24	0.71	2.32	4.49	5.77	2.91
SERIES IVC.—						
Peas with 1wt superphos- phate . . . . .	2.15	1.59	2.14	5.39	5.74	3.40
SERIES IVD.—						
Rape with 1wt. superphos- phate . . . . .	1.59	1.41	2.16	6.48	2.05	2.74
SERIES VIA.—						
Pasture after barley with 2cwt. superphosphate. . .	1.23	1.27	1.78	2.53	4.01	2.16
SERIES VIb.—						
Pasture after oats with 2cwt. superphosphate. . .	1.46	1.47	1.81	3.95	3.96	2.53
SERIES VII.—						
Lucerne sown with wheat and 2cwt. superphosphate 1916 and 1921 crop (plot 42) . . . . .	1.49	2.06	1.52	—	—	Means, Three Years' Period. 1.69
1917 crop (plot 46) . . .	—	1.05	1.28	5.80	—	2.71
1918 crop (plot 45) . . .	—	—	1.38	4.63	7.57	4.53
1919 crop (plot 44) . . .	—	—	—	3.09	4.46	—
1920 crop (plot 43) . . .	—	—	—	—	6.79	—



*Graving Crops in Rotation Plots— continued.*

SHEEP VIII.—	Sheep per Acre per Year.					Means- Two Years' Period.
	1917.	1918.	1919.	1920.	1921.	
Rye grass sown with wheat and 2cwt. superphosphate						
1915 crop (plot 48) . . .	0.97	—	—	—	—	—
1916 crop (plot 47) . . .	2.20	1.30	—	—	—	1.75
1917 crop (plot 50) . . .	—	2.53	2.35	—	—	2.44
1918 crop (plot 49) . . .	—	—	1.77	6.29	—	4.03
1919 crop (plot 48) . . .	—	—	—	4.85	6.29	5.57
1920 crop (plot 47) . . .	—	—	—	—	4.80	—
						Means, 1919-21.
Continuous grazing . . . . .	—	—	0.78	3.94	5.28	3.33

*Seed in Rotation Plots, 1921.*

Wheat—Federation . . . . .	75lbs. per acre.
Barley—Roseworthy Oregon . . . . .	50lbs. per acre.
Oats—Scotch Grey . . . . .	80lbs. per acre.
Peas—Early Dun . . . . .	100lbs. per acre.
Rape—Dwarf Essex . . . . .	5lbs. per acre.
Lucerne—Hunter River . . . . .	6lbs. per acre.
Rye Grass—Italian . . . . .	9½lbs. per acre.
Sorghum—Early Amber Cane . . . . .	6lbs. per acre.

# Cyclone

## Spring Coil Fence

W. &amp; W. 827.

**Cheaper Mile per Mile than Plain Wire Fencing.**

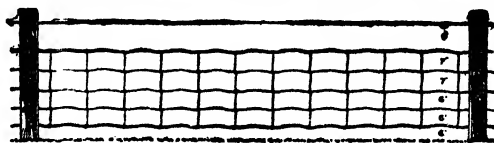


Fig. 7—Cyclone Spring Coil Sheep Fence.

Cyclone Special Sheep Fence, 5 lines, 26in. high. Top and bottom lines No. 9 gauge wire; intermediate line wires No. 11 gauge; with cross ties of No. 13 gauge every 12in. and immovably fixed to the line wires. All wire used in Cyclone Fences is the best heavily galvanized steel wire.

Cyclone Spring Coil Fences can't slack out. They remain taut on undulating and hilly country. Posts can be set much further apart and the "crimp" in the wire allows the fence to "give" (like elastic) before great strain, but not to break. A firm favorite with breeders of crossbred sheep.

**Send for our Catalogue — Posted Free on Request.**

**CYCLONE PROPRIETARY, LIMITED,**  
129, WAYMOUTH STREET, ADELAIDE.

## CONFERENCE OF MID-NORTHERN BRANCHES.

The Annual Conference of Mid-Northern Branches of the Agricultural Bureau was held at Crystal Brook on Wednesday, March 8th. The gathering was opened by the Minister of Agriculture (Hon. T. Pascoe, M.L.C.), and the Department of Agriculture was represented by the Director of Agriculture (Professor Arthur J. Perkins), the Poultry Expert (Mr. D. F. Laurie), the Chief Inspector of Stock (Mr. T. H. Williams), Mr. W. S. Kelly, and Mr. Geo. Jeffrey (members Advisory Board of Agriculture), and the Secretary (Mr. H. J. Finnis) were also present.

The Conference was presided over by Mr. A. E. S. Clark (President of the Crystal Brook Branch).

Addresses were delivered by the Director of Agriculture, entitled "Some Causes of Defective Germination in Wheat," and Mr. W. S. Kelly spoke on the subject, "Principles of Breeding." The following papers were contributed:—"Bulk Handling of Wheat," Mr. J. J. Darley (Narridy Branch); "The Agricultural Bureau and its Early History," Mr. W. J. Venning (Crystal Brook); "Farm Book-keeping," Mr. G. C. Rundell (Yaaka); "Some Aspects of the Timber Problem," Mr. R. R. Shaw (Crystal Brook); and "Poultry," Mr. C. C. Buttfeld (Crystal Brook).

During the evening session the following resolutions were carried:— (1) "That, in the opinion of this Conference, the Act referring to the compulsory dipping of sheep should be strictly enforced." (2) "That this Conference requests that, with a view to fostering interest in Bureau work generally, especially as it applies to young members, that the Government be asked, (a) that a free railway pass be issued annually to a percentage of the members of such Branch who qualify for the same; (b) that a membership badge be inaugurated, so that members when travelling may be able to recognise fellow Bureau members." On the motion of Mr. Blesing (Laura), it was decided that the next Conference of Mid-Northern Branches should be held at Laura during the second week in March, 1923. A fine display of fruit and vegetables was staged by the members of the Beetaloo Valley Branch.

## ADVISORY BOARD OF AGRICULTURE.

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The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, March 1st. The meeting was immediately adjourned until the following day to enable members to attend the funeral of the late Mr. A. W. Shillabeer.

The adjourned meeting was held on Thursday, March 2nd, there being present Mr. C. J. Tuckwell (Chairman), Professor Arthur J. Perkins (Director of Agriculture), Capt. S. A. White, Messrs. T. H. Williams, F. Coleman, W. S. Kelly, A. M. Dawkins, and the Secretary (Mr. H. J. Finnis). An apology was received from Mr. H. Wicks.

*Death of Mr. A. W. Shillabeer.*—It was decided that a letter of condolence should be sent to the widow and family of the late Mr. A. W. Shillabeer, who was an active member of the Board for some time.

*Trucking Facilities for Mallee Lands.*—A report on the resolutions from the Conference of Mallee Lands Branches concerning the time allowed for loading trucks, and the provision of trucks for the Peebinga line, was received from the Railways Commissioner. It was decided to submit the report to the Nunkeri and Yurgo Branch, and ask them to comment on the Commissioner's statement.

*Compulsory Dipping of Sheep.*—A communication was received from the Gladstone Branch intimating that the Act controlling the compulsory dipping of sheep was not being enforced in that district. It was stated that only a portion of the farmers were dipping their sheep. The Chief Inspector of Stock (Mr. T. H. Williams) stated that the Compulsory Dipping of Sheep Act was still in force, and that stockowners who did not dip their sheep rendered themselves liable to prosecution under the regulations of the Act. The Secretary was instructed to advise the Branch in terms of Mr. Williams' statement.

*River Murray Pruning Competitions.*—The Secretary (Mr. H. J. Finnis) mentioned that the committee in charge of the River Murray Pruning Competitions for 1922 were anxious to secure the services of the Horticultural Instructor (Mr. Geo. Quinn) or, failing that officer, the Manager of the Berri Orchard (Mr. C. G. Savage) to adjudicate at this year's competition. It was decided to transmit the request to the Minister through the Director of Agriculture.

*Destruction of Lucerne Flea.*—Correspondence was received from Mr. W. Heithersay, of Fullarton, intimating that he had been successful in destroying lucerne flea at the Burra and Booborowie. The

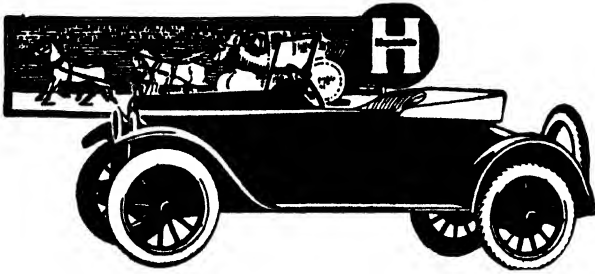
Board decided to ask the Minister that arrangements for a demonstration of the spraying plant might be made with the Horticultural Instructor (Mr. Geo. Quinn) when the lucerne flea next made its appearance.

*Destruction of Stinkwort.*—In a communication received from Mr. A. W. Barns, of Wudinna, attention was drawn to the fact that stinkwort had made its appearance on Central Eyre Peninsula. The correspondent stated that plants were growing along the railway line in the Warrambo and Tooligie Station yards, and it was asked that the weeds should be destroyed before they spread over a larger area. The Secretary was instructed to report the matter to the Railways Commissioner, and ask that steps should be taken to eradicate the plants.

*Life Member.*—The name of Mr. C. Jarman, of the Clare Branch, was added to the roll of life members.

*New Branch.*—Approval was given for the formation of a new Branch of Kangarilla, with the following gentlemen as foundation members—T. C. Golder, W. H. Biddle, W. E. Bottrill, F. A. Baker, L. Smart, W. Jackson, T. Mutton, H. Jones, A. Bilney, R. G. Morphet, F. W. Thorpe, F. and B. White.

*New Members.*—The undermentioned names were added to the rolls of existing Branches:—Second Valley—C. W. Ness, A. J. Grundy, F. Putland, G. G. Cant, A. Bennett, E. A. Schmidt, G. P. Rephchange, J. Hamlyn, R. Mitchell, L. Ness; Weavers—A. Sherriff, W. Sherriff, O. P. Jung, C. Jones, G. A. Bishop, S. Brundell, A. P. Anderson, A. E. Anderson; Balhannah—E. Delcharr, L. Eckers; Mount Pleasant—C. Harding, C. Richardson; Blackwood—E. Conlon, G. Hannaford, Perryman; Windsor—C. Lindsay, A. Crouch; Stockport—Fuller, B. Bald, C. B. Koth, F. Whitelaw, H. F. Fiegert; Wilkawatt—H. O. B. Crittenden; Block E.—C. D. Davenport, M. Gore, H. A. Packer, R. P. Bennett, F. Haycraft, R. R. Loveday, E. K. Weir, S. W. Lewis; Blyth—C. Milde; Hartley—O. J. Harvey; Colton—J. J. Conlin, C. Hull, L. M. Barns; Miltalie—H. Goscombe; Virginia—L. W. Flemming, W. E. Renfrey, W. E. Eves, A. Baker, H. Reedy; Owen—A. J. Freebairn, F. D. Lake, J. Painter, jun.; Kybybolite—S. C. Billinghurst; Paskeville—A. N. Abbott, C. N. Daniel, J. Sidy, C. H. Price, L. J. Bussenschutt; Weavers—J. Cornish, R. Jolly; Lone Gum—E. H. Kernot; McLachlan—A. Dick, A. Green, L. Hawke; Tatiara—E. J. Buckley; Parilla—H. Koch; Glencoe—S. W. McRostie; Milang—W. A. Story; Kongorong—M. Hayward.



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*We believe the Hupmobile  
to be the Best Car of its  
class in the World.*

Phoenix Motor Company, Limited,  
Sole Agents,

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# THE COMFORT CAR

## RIVER MURRAY HERD TESTING ASSOCIATION.

## RESULTS OF BUTTERFAT TESTS FOR DECEMBER, 1921.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during December.	Per Cow during December.	Per Cow October to December.	Per Herd during December.	Per Cow during December.	Per Cow October to December.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/A	13	7-29	6,101	469-31	1,706-93	248-36	19-10	74-70
1/C	27	26-32	19,864	735-70	2,455-86	843-24	31-23	103-70
1/E	16-29	12-36	8,623	529-34	1,589-81	381-57	23-42	71-72
1/G	47-84	40-48	45,511-5	951-33	2,586-76	1,797-87	37-58	99-97
1/I	10	8-19	6,780-5	678-05	2,223-95	328-98	32-90	93-70
1/J	17	14-77	11,455	673-82	1,900-12	511-73	30-10	81-80
1/K	15-65	13-20	11,094-5	708-91	2,150-87	472-82	30-21	91-50
1/L	13	9	6,324	486-46	1,643-92	317-35	24-41	81-15
1/M	19	15-81	9,843-5	518-08	1,479-11	415-47	21-87	65-78
1/O	29	26-45	17,031	587-24	1,808-77	789-82	27-24	82-66
1/R	19	16-97	7,442	391-07	1,086-18	376-05	19-79	53-25
1/S	16	12-36	6,985-5	436-59	1,615-37	287-56	17-97	70-45
1/T	12	8	4,665-5	388-70	1,185-50	260-22	21-69	60-66
1/U	14	11-32	11,193-5	799-53	1,700-43	503-22	35-95	74-76
1/V	16	14-84	8,611	538-19	1,501-63	367-99	23-00	63-69
Mean	18-99	15-82	12,101-7	637-42	1,889-91	526-82	27-75	81-30

**CHARLES WHITING,**  
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Full Prices and Prompt Settlements for All Grades Wheat Oats,  
Barley, Peas, Chaff, &c.

40 Years Adelaide Grain Trade.

## THE AGRICULTURAL OUTLOOK.

**Turretfield.**—Weather—The weather has been exceptionally dry; the days have been cool and the nights dewy; there were a few very windy days. Crops—The grape crop is now in, except in a few vineyards that had a large quantity to pick. The yield has been better than was expected a couple of months ago. Natural feed is very scarce. Stock are in fair condition; dairy cows are going off their milk on account of the want of a green picking. The long, dry spell has allowed the roads to cut up badly. A good rain now and again keeps the roads in better order.

**Veitch.**—Weather is very mild and dry, but seasonable; have not registered any rain for March. Crops—Seeding operations have started on some farms, oats being sown, and barley for green feed. Natural feed is getting scarce. Stock are all in healthy condition. Pests—Rabbits are being poisoned in this district, and are taking the pollard well.

**Kybybolite.**—Weather has been fine and dry, only about 20 points of rain having been registered. One severe wind caused considerable loss to the apple crop. Crops—Very little preparation for cereal seeding has been done. Growth of sorrel has caused some fallows to have been worked back dry. Conditions have been good for grading and levelling land for irrigation. Natural feed is plentiful.

### BAGOT, SHAKES, & LEWIS, LTD.,

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#### SUPERPHOSPHATES.

Woolpacks. Field Gates. Bran Bags. Twines. Galvanized Iron. Bore  
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#### "CLAN LINE STEAMERS."

Head Office : 18, King William Street.

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Light Square, Adelaide.

## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on April 1st, 1922:—

**BUTTER.**—Owing to the improved tone in the London butter market, and buyers being anxious to secure supplies, prices throughout the Commonwealth sharply advanced. During the month values showed an improvement of 2½d. per lb. This is very encouraging to those interested in the dairying industry, having in view the low rates that have ruled this season. Good prices are practically assured for some time to come. At the close of the month first-grade to choicest factory and creamery, in bulk, sold from 1s. 4½d. to 1s. 5d.; private separators and dairies, 1s. 3d. to 1s. 4d.; fair quality, 1s. to 1s. 2d.; store and collectors', 10d. to 11½d.

**EGGS.**—Throughout the month demand both for local and export has been very brisk, and in consequence values have advanced. At the end of the month fresh hen sold at 1s. 8d.; duck, 1s. 9d.

**CHEESE.**—In sympathy with the advance in prices of butters, this line improved in value. Export buyers are taking all offering, and there has also been a good local trade. This has cleared the stocks that have been accumulating somewhat, range being from 7d. to 8d. for large to loaf at the close of period.

**HONEY.**—Ample supplies have come forward, but market has been kept nicely cleared, owing to brisk demand. This only applies to prime clear extracted, which, at close of month, sold at 3½d. to 4d. per lb.; second grades are slow of sale at 2d. to 2½d. Beeswax wanted at 1s. 8d. to 1s. 9d. for clear samples.

**ALMONDS.**—Buyers continue to take up all surplus, and although forwarding's have been heavy, they have found a very ready sale. At end of month Brandis sold at 12½d.; mixed softshells, 11½d.; hardshells, 5½d.; kernels, 2s. to 2s. 1d.

**BACON.**—Values have come back during the month, which has caused much better sales, best factory-cured sides selling at 11d. to 1s.; middles, 1s. 1d. to 1s. 2d.; hams, 1s. 3d. Lard, in packets, 7½d.; bulk, 7d.

**LIVE POULTRY.**—The quantities coming forward are quite in keeping with the lots usually received before Easter, and the pleasing feature is the active demand that rules. Our three weekly auctions, Tuesdays, Thursdays, and Fridays, have consisted of large catalogues, and with representative gatherings of the trade, active bidding has been experienced, nice clearances being effected at satisfactory prices to consignors. At close of period rates were:—Prime roosters, 4s. 9d. to 6s. 4d.; nice-conditioned cockerels, 3s. 3d. to 4s. 6d.; plump hens, 3s. 6d. to 5s. 3d.; medium hens, 2s. 9d. to 3s. 5d.; light birds, 2s. to 2s. 6d. (few pens lower); ducks, 2s. 4d. to 6s. for good quality; geese, 4s. 9d. to 6s. 3d.; turkeys, prime conditioned, 1s. to 1s. 5d. per lb. live weight; fair conditioned, 9d. to 11½d. per lb.; fattening sorts lower; pigeons, 5½d.

**POTATOES.**—Since our last report Gambier Pinkeyes have cut out, and the digging of Millicent Redskins has commenced. The quality of the latter varies considerably, but some parcels are quite satisfactory. The Victorian market has eased considerably, and with fair rains there should be a very heavy production. The market at close of month under review quoted Millicent Redskins at £3 17s. 6d. to £4 per ton on trucks Mile End, in truck loads; Victorian Carmens at £7 10s. to £8 per ton, Mile End.

**ONIONS.**—There is little alteration to report in this line, although fair parcels are offering, and market seems inclined to ease. Quotations are from 8s. to 9s. per cwt. on trucks, Mile End. Truck loads, £6 10s. to £7 10s.



## EGG-LAYING COMPETITION, 1921-1922.

HELD AT THE PARAFIELD POULTRY STATION, PARAFIELD, UNDER THE DIRECTION OF D. F. LAURIE (GOVERNMENT POULTRY EXPERT AND LECTURER).

Total No. of Pens.—Section I., Light Breeds (Single Testing), 24—3 pullets in each entry. Section II., Heavy Breeds (Single Testing, 13—3 pullets in each entry. Section III., Light Breeds, 25—6 pullets in each pen. Section IV., Heavy Breeds, 9—6 pullets in each pen.

TWELVE MONTHS' TEST. TO START ON MARCH 1ST, 1921, AND TO TERMINATE ON FEBRUARY 28TH, 1922.

## SECTION 1.—LIGHT BREEDS (SINGLE TESTING). THREE PULLETS IN EACH ENTRY.

Row No.	Name and Address.	Bird No.	Final Scores.	Bird No.	Final Scores.	Bird No.	Final Scores.
WHITE LEGHORNS.							
E	Bamford, W. H., 74, Adelaide Road, Glenelg	1	229	2	218	3	199
E	Connor, D. C., Gawler	4	185	5	189	6	*
E	Willington, Mrs. G., Milang	7	202	8	101	9	175
E	Nancarrow, J. T., Plympton	10	161	11	125	12	161
E	Broadview Poultry Farm, Seaton Park	13	183	14	151	15	158
E	Stevens, H. J., Broken Hill	16	150	17	116	18	130
E	Monkhouse, A. J., Woodside	19	85	20	146	21	107
E	Turvey, D. J., Milang	22	162	23	157	24	129
E	Lampert, Mrs. S., Piccadilly	25	146	26	132	27	92
E	Nancarrow, J. T., Plympton	28	178	29	171	30	141
E	Small, E. W., Mount Gambier	31	161	32	171	33	119
E	Coleman, A. C., Grange	34	158	35	*	36	164
E	Broadview Poultry Farm, Seaton Park	37	200	38	165	39	176
E	Holmes, F. A., Naracoorte	40	98	41	172	42	164
E	Lampert, Mrs. S., Piccadilly	43	222	44	*	45	162
E	Green, F. W. H., Monteith	46	109	47	158	48	102
E	Howie, H. H., Mount Gambier	49	133	50	142	51	Dead
E	Willmott, H. J., Clarence Park	52	119	53	72	54	*
E	Stockman, A., Goodwood	55	152	56	*	57	99
E	Green, A. J., Crystal Brook	58	156	59	110	60	148
E	Herbert, C., Alberton	61	100	62	141	63	104
E	Blake, Mrs. B. L., Berowra, N.S.W.	64	Dead	65	160	66	158
F	Tilly, P. N., Balwyn, Victoria	1	186	2	*	3	*
F	Dugan, T., Lower Light	4	237	5	192	6	211
Totals		—	3,712	—	2,989	—	2,989

## SECTION 2.—HEAVY BREED (SINGLE TESTING). THREE PULLETS EACH ENTRY.

## BLACK ORPINGTONS.

F	Lampert, Mrs. S., Piccadilly	7	*	8	*	9	196
F	Shaw, R. R., Crystal Brook	10	164	11	*	12	*
F	Farr, K. H., Fullarton Estate	13	246	14	236	15	184
F	Alford, T., Broken Hill	16	*	17	*	18	268
F	Lampert, Mrs. S., Piccadilly	19	*	20	212	21	Dead
F	Holmes, F. A., Naracoorte	22	140	23	147	24	135
F	Shaw, R. R., Crystal Brook	25	128	26	109	27	102

\* Failed under Regulation 12.

SECTION 2.—HEAVY BREED (SINGLE TESTING) THREE PULLETS EACH ENTRY—*contd.*BLACK ORPINGTONS—*continued.*

Row No.	Name and Address.	Bird No.	Final Scores.	Bird No.	Final Scores.	Bird No.	Final Scores.
F	Wheaton, S. P., Bute .....	28	177	29	Dead	30	144
F	Bansemer, Mrs. B., Beaumont ..	31	*	32	*	33	*
F	Farr, K. H., Fullarton Estate...	34	248	35	*	36	239
F	Mortimer, G., Broken Hill.....	37	225	38	241	39	*
RHODE ISLAND REDS.							
F	Stockman, A., Goodwood .....	40	*	41	165	42	Dead
F	Tester, G., Naracoorte .....	43	*	44	163	45	61
Totals .....		—	1,328	—	1,273	—	1,329

## SECTION 3.—LIGHT BREEDS (PEN TESTS). SIX PULLETS IN EACH PEN.

Pen No.	Name and Address.	Breed.	Final Scores.
1	Anderson, S., Gawler Railway .....	White Leghorns.....	1,183
2	Pugsley, A., Hindmarsh.....	" .....	616†
3	Connor, D. C., Gawler .....	" .....	1,146
4	Willington, Mrs. G., Milang.....	" .....	1,025
5	Norton Bros., Seaton Park.....	" .....	966
6	Nancarrow, J. T., Plympton.....	" .....	861†
7	Small, E. W., Mount Gambier .....	" .....	1,094†
8	Buchan, J. S., Seaton Park.....	" .....	1,245
9	Anderson, J., Prospect.....	" .....	963
10	Pugsley, A., Hindmarsh.....	" .....	759
11	Alford, T., Broken Hill .....	" .....	*
12	Pool, F. J., North Norwood .....	" .....	961
13	Nancarrow, J. T., Plympton.....	" .....	1,184
14	Smith & Gwynne, Gawler South .....	" .....	1,194
15	Ratten, C. A., Mile End.....	" .....	1,125
16	Howie, H. H., Mount Gambier.....	" .....	1,267†
17	Willmott, H. J., Clarence Park.....	" .....	927
18	Anderson, Wm., Kapunda.....	" .....	1,163
19	Herbert, C., Alberton .....	" .....	1,145
20	Sparrow, F. H. L., late A.I.F., Beverley ..	" .....	1,122†
21	Clee Hill Stud Poultry Farm, Box Hill, Victoria	" .....	1,046
22	Beythien, E. W., Scott's Creek.....	" .....	1,045
23	Provis & Sons, W., Tumby Bay.....	" .....	1,094
24	Dugan, T., Lower Light.....	" .....	1,077
25	Bansemer, Mrs. B., Beaumont .....	" .....	1,320
Totals .....			25,528

## SECTION 4.—HEAVY BREEDS (PEN TEST). SIX PULLETS EACH ENTRY.

26	Lampert, Mrs. S., Piccadilly.....	Black Orpingtons .....	938†
27	Farr, K. H., Fullarton Estate.....	" .....	981
28	Bansemer, Mrs. B., Beaumont .....	" .....	—
29	Farr, K. H., Fullarton Estate.....	" .....	1,164
30	Lampert, Mrs. S., Piccadilly .....	" .....	*
31	Alford, T., Broken Hill .....	" .....	*
32	Clee Hill Stud Poultry Farm, Box Hill, Victoria	" .....	1,114
33	Lampert, Mrs. S., Piccadilly .....	" .....	1,300
34	Ryan, Jas., Coburg, Victoria .....	Rhode Island Reds ..	1,342
Totals .....			6,839

\* Failed under Regulation 12. † One bird dead. ‡ Two birds dead.

## DIVISION B.—STANDARD BREEDS ONLY.

19 Pens each of 6 Birds=114 Birds.

COMMENCING APRIL 1ST, 1921. TERMINATES FEBRUARY 28TH, 1922.

Pen No.	Name and Address.	Breed.	Final Scores.
37	*Lampert, Mrs. S., Piccadilly .....	White Leghorn .....	—
38	*Newcombe, E. G., Alberton .....	" .....	—
39	Packham, C. D., Kensington Park .....	" .....	956
40	*Beythien, E. W., Scott's Creek .....	" .....	—
42	Packham, C. D., Kensington Park .....	" .....	907†
43	*Newcombe, E. C., Alberton .....	" .....	—
44	Belmont Orpington Yards, Evandale .....	Black Orpington .....	1,016§
45	*Lampert, Mrs. S., Piccadilly .....	" .....	—
46	*Farr, K. H., Fullarton Estate .....	" .....	—
47	Bansemmer, Mrs. B., Beaumont .....	" .....	1,149
48	Addison, Mrs. A. L., Malvern .....	Rhode Island Red .....	919†
50	Hill, H. V., West Adelaide .....	" .....	781
51	Beer, A. C., Gilberton .....	" .....	—
52	Perkins, C. W., North Norwood .....	Silver Wyandotte .....	977
53	Addison, A. L., Malvern .....	White Wyandotte .....	717†
54	Bagshaw, W. E., Hermitage .....	White Rocks .....	784
55	Bagshaw, W. E., Hermitage .....	Barred Rocks .....	780
Totals .....			8,986

\* Failed under Regulation 12. † One bird dead. § Three birds dead.

# Jelbarts Proprietary, Limited,

## ENGINEERS,

Works and Offices—

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### "JELBART" CRUDE OIL TRACTORS

### Lead the World.

They have never been equalled for Power, Economy, and Long Life. They have six public records to their credit. They give twice the power for the rating of any imported tractor, and, power for power, they are only half the cost of imported machines. There is nothing capable of competing with them on kerosene for cheapness of running or for ease of manipulation, and on crude oil they add to this advantage by reducing by more than half their running costs on kerosene.

Our SUCTION GAS PLANTS, using wood fuel, are marvels of economy. All sizes obtainable from 8 h.p. to 100 h.p.

**USERS OF POWER SHOULD WRITE FOR PARTICULARS.**

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of March 1922, also the average precipitation to the end of March, and the average annual rainfall.

Station.	For March, 1922.	To end March, 1922.	Average to end March, 1922.	Average Annual Rainfall	Station.	For March, 1922.	To end March, 1922.	Average to end March, 1922.	Average Annual Rainfall
FAR NORTH AND UPPER WORTH.					LOWER NORTH—continued.				
Oodnadatta.....	0.08	1.37	1.90	4.83	Spalding .....	0.29	1.64	2.13	20.33
Marree .....	—	0.92	1.51	6.10	Gulnare .....	0.22	1.68	2.02	19.23
Farina .....	—	0.13	1.81	6.73	Yacka .....	0.33	1.26	1.70	15.34
Copley .....	—	0.74	1.99	8.45	Koolunga .....	0.20	1.21	1.75	15.79
Beltana .....	—	0.77	2.23	9.01	Snowtown .....	0.03	1.30	1.98	15.95
Blinman .....	—	1.11	2.61	12.62	Brinkworth .....	0.18	0.93	1.88	16.16
Tarcoola .....	0.15	0.52	0.93	7.59	Blyth .....	0.11	1.25	2.00	16.75
Hookina .....	—	0.66	2.05	13.30	Clare .....	0.25	2.10	2.70	24.61
Hawker .....	—	0.62	1.81	12.72	Mintaro .....	0.29	2.06	2.27	23.26
Wilson .....	—	0.73	1.93	12.33	Watervale .....	0.35	2.86	2.80	27.41
Gordon .....	—	0.66	2.18	11.05	Auburn .....	0.30	2.62	2.92	24.25
Quorn .....	—	0.69	1.90	14.00	Hoyleton .....	0.18	1.71	2.09	17.79
Port Augusta .....	0.14	0.80	1.79	9.54	Balaklava .....	0.10	1.09	2.00	15.87
Port Augusta West .....	0.03	0.63	1.56	9.53	Port Wakefield .....	—	1.09	2.18	13.19
Bruce .....	—	0.47	1.94	10.40	Terowie .....	—	2.21	2.18	13.67
Hammond .....	—	0.65	2.02	11.61	Yarowie .....	0.08	2.80	2.22	14.06
Wilmington .....	—	0.87	2.27	18.17	Hallett .....	0.06	1.40	1.96	16.37
Willowie .....	—	0.48	2.00	12.16	Mount Bryan .....	0.14	1.20	1.95	16.54
Melrose .....	0.10	1.44	3.21	23.21	Burra .....	0.13	1.23	2.31	17.96
Booleroo Centre .....	—	0.83	2.08	15.53	Farrell's Flat .....	0.02	1.01	2.16	18.90
Port Germein .....	0.11	0.87	1.85	12.79	WEST OF MURRAY RANGE.				
Wirrabara .....	0.09	0.79	2.34	19.62	Manoora .....	0.26	1.42	2.02	18.03
Appila .....	0.9	0.74	3.24	14.98	Saddleworth .....	0.24	1.83	2.43	19.70
Craddock .....	—	0.63	1.87	11.18	Marrabel .....	0.10	1.68	1.96	19.55
Carrieton .....	—	0.91	2.01	12.63	Riverton .....	0.25	1.63	2.48	20.66
Johnburg .....	—	0.66	1.73	10.50	Tarlee .....	0.15	1.24	2.25	17.75
Eurelia .....	—	0.91	2.06	13.36	Stockport .....	0.15	1.34	2.09	16.34
Orroroo .....	—	1.07	2.34	13.57	Hamley Bridge .....	0.19	1.58	2.17	16.45
Neckara .....	—	1.27	2.38	11.33	Kapunda .....	0.13	1.50	2.58	19.80
Black Rock .....	—	0.80	2.08	12.51	Freeling .....	0.12	1.55	2.30	17.82
Uoolta .....	—	0.74	2.20	11.90	Greenock .....	0.16	1.91	2.45	21.56
Peterboro .....	—	0.82	2.24	13.43	Truro .....	0.07	1.36	2.40	20.07
Yongala .....	—	0.85	2.07	14.41	Stockwell .....	0.07	1.41	2.37	20.24
LOWER NORTH-EAST.					Nuriootpa .....	0.13	2.00	2.39	20.94
Yunta .....	—	0.53	1.98	8.75	Angaston .....	0.11	2.47	2.51	22.44
Waukaringa .....	—	0.29	1.72	8.41	Tanunda .....	0.10	2.48	2.60	22.17
Mannahill .....	—	0.64	1.90	8.54	Lyndoch .....	0.13	2.08	2.28	22.81
Cockburn .....	—	0.84	1.83	8.22	Williamstown .....	0.05	2.31	2.57	27.52
Broken Hill, N.S.W. .....	—	0.87	2.17	9.91	ADELAIDE PLAINS.				
LOWER NORTH.					Mallala .....	0.14	1.31	2.10	16.58
Port Pirie .....	0.14	0.57	1.91	13.36	Roseworthy .....	0.15	1.39	2.13	17.27
Port Broughton .....	—	0.82	1.73	14.18	Gawler .....	0.22	1.42	2.35	19.08
Bute .....	0.07	1.21	1.77	15.65	Two Wells .....	0.02	1.16	2.02	15.85
Laura .....	0.21	1.67	2.22	18.16	Virginia .....	0.10	1.54	2.17	17.32
Calowie .....	0.13	1.61	2.21	17.07	Smithfield .....	0.07	1.13	2.22	17.15
Jamestown .....	0.06	1.40	2.17	17.74	Salisbury .....	0.05	1.64	2.35	18.49
Bundaleer W. Wks. .....	0.21	1.39	2.02	17.89	North Adelaide .....	0.23	3.84	2.58	22.09
Gladstone .....	0.24	1.71	1.97	16.13	Adelaide .....	0.13	2.40	2.41	21.03
Crystal Brook .....	0.08	1.78	1.95	15.74	Glenelg .....	0.19	2.05	2.29	18.87
Georgetown .....	0.26	2.04	2.21	18.44	Brighton .....	0.15	1.66	2.62	21.24
Narriady .....	0.13	1.02	1.99	16.41	Mitcham .....	0.10	3.70	2.50	23.92
Redhill .....	0.10	1.12	1.89	16.75	Glen Osmond .....	0.11	3.96	2.68	25.74
					Magill .....	0.10	3.26	2.83	25.27

**RAINFALL**—*continued.*

Station.	For March, 1922.	To end March, 1922.	Av'ge. to end March, 1922.	Av'ge. Annual Rainfall
MOUNT LOFTY RANGES.				
Teatree Gully .....	0-20	3-32	3-04	27-77
Stirling West .....	0-42	7-37	3-43	46-62
Uraidla .....	0-37	7-04	4-30	44-06
Clarendon .....	0-29	—11	3-47	32-98
Morphett Vale .....	0-27	2-31	2-63	22-76
Noarlunga .....	0-12	1-46	2-29	20-27
Willunga .....	0-10	4-54	2-74	25-87
Aldinga .....	0-13	3-23	2-35	20-24
Myponga .....	0-22	2-98	2-77	28-44
Normanville .....	0-22	2-72	2-16	20-51
Yankalilla .....	0-29	3-71	2-57	22-99
Mount Pleasant ...	0-26	3-51	2-74	27-04
Birdwood .....	0-13	2-86	2-91	29-26
Gumeracha .....	0-20	3-71	3-20	33-25
Millbrook Reservoir .....	0-37	4-11	—	—
Tweedvale .....	0-19	4-39	3-01	35-54
Woodside .....	0-25	5-05	3-09	32-08
Ambleside .....	0-16	5-74	3-28	34-62
Nairne .....	0-33	3-35	3-23	28-43
Mount Barker .....	0-29	5-21	3-34	31-13
Echunga .....	0-36	4-54	3-41	32-91
Macclesfield .....	0-31	3-97	3-22	30-53
Meadows .....	0-28	5-46	3-72	36-04
Strathalbyn .....	0-19	2-13	2-49	19-26
MURRAY FLATS AND VALLEY.				
Meningie .....	0-19	1-31	2-14	18-66
Milang .....	0-11	1-49	2-05	15-42
Langhorne's Bridge .....	0-18	1-74	2-00	14-55
Wellington .....	0-09	1-06	2-10	14-68
Tailem Bend .....	0-12	0-94	2-40	14-11
Murray Bridge .....	0-09	0-70	2-11	13-83
Callington .....	0-14	1-15	2-29	15-37
Mannum .....	0-13	0-67	1-89	11-52
Palmer .....	0-09	1-03	2-17	15-24
Sedan .....	0-10	0-58	1-82	12-13
Swan Reach .....	0-10	0-44	1-94	10-82
Blanchetown .....	0-07	0-16	1-85	10-16
Eudunda .....	0-08	0-77	2-16	17-50
Sutherland .....	—	0-16	1-56	10-92
Morgan .....	0-09	0-52	1-54	9-18
Waikerie .....	0-06	0-40	1-68	9-68
Overland Corner...	—	0-26	1-99	11-08
Loxton .....	0-09	1-10	2-69	12-58
Renmark .....	0-04	0-86	1-93	11-02
WEST OF SPENCER'S GULF.				
Eucala .....	0-35	1-04	2-09	10-02
White Well .....	0-21	1-28	1-48	9-10
Fowler's Bay .....	0-23	0-85	1-38	12-19
Penong .....	0-26	0-84	1-61	12-25
Ceduna .....	0-15	0-15	1-28	10-32
Smoky Bay .....	0-15	0-56	1-20	10-92
Petina .....	0-12	1-23	1-38	13-05
Streaky Bay .....	0-19	0-79	1-50	15-11
Talia .....	0-15	1-09	1-21	15-38
Port Elliston .....	0-20	0-94	1-37	16-53
Cummins .....	0-08	1-03	—	18-87

Station.	For March, 1922.	To end March, 1922.	Av'ge. to end March, 1922.	Av'ge. Annual Rainfall
WEST OF SPENCER'S GULF—continued.				
Port Lincoln .....	0-65	1-80	1-94	19-75
Tumby .....	0-13	0-89	1-93	14-62
Carrow .....	0-10	0-39	1-58	14-64
Arno Bay .....	0-11	0-98	1-89	13-08
Cowell .....	0-12	0-54	1-80	11-52
Minnipa .....	0-06	1-10	—	—
YORKE PENINSULA.				
Wallaroo .....	0-10	0-57	1-83	14-09
Kadina .....	0-10	0-89	1-87	15-93
Moonta .....	0-13	0-76	1-88	15-25
Green's Plains .....	0-11	1-23	1-72	15-72
Maitland .....	0-14	2-38	2-03	20-05
Airdrossan .....	0-11	1-36	1-74	13-95
Port Victoria .....	0-11	1-36	1-62	15-35
Curramulka .....	0-07	2-19	2-04	18-16
Minlaton .....	0-22	2-54	1-86	17-79
Brentwood .....	0-20	2-02	1-70	15-54
Stansbury .....	0-05	2-68	1-89	16-90
Warooka .....	0-21	2-22	1-67	17-69
Yorketown .....	0-16	1-61	1-72	17-22
Edithburgh .....	0-18	1-89	1-88	16-53
SOUTH AND SOUTH-EAST.				
Cape Borda .....	0-66	1-69	2-09	25-01
Kingscote .....	0-37	1-81	1-82	19-01
Penneshaw .....	0-41	1-58	2-05	18-97
Victor Harbor .....	0-31	2-12	2-49	21-43
Port Elliot .....	0-25	1-78	2-40	20-00
Goolwa .....	0-28	1-15	2-32	17-83
Pinnaroo .....	0-03	0-58	2-59	—
Parilla .....	—	1-08	1-77	—
Lameroo .....	0-02	1-51	2-04	—
Parrakie .....	0-05	0-89	1-88	15-32
Geranium .....	0-06	0-73	2-03	14-39
Peake .....	0-07	0-63	2-42	16-27
Cooke's Plains .....	0-14	0-95	2-03	14-27
Coomandook .....	—	0-98	2-11	15-96
Coonalpyn .....	0-03	0-44	2-10	15-91
Tintinara .....	0-12	0-73	2-10	14-84
Keith .....	0-06	1-15	2-13	17-31
Bordertown .....	0-10	1-07	2-25	17-44
Wolsley .....	0-09	0-92	1-96	18-54
Frances .....	0-02	1-97	—	18-19
Naracoorte .....	0-27	1-21	2-52	19-44
Penola .....	0-40	0-87	3-13	18-06
Lucindale .....	0-31	1-33	2-33	19-78
Kingston .....	0-36	2-45	2-41	22-46
Robe .....	0-47	3-06	2-51	22-36
Beachport .....	0-37	2-84	2-96	22-01
Millicent .....	0-54	2-62	3-30	24-44
Kalangadoo .....	0-60	1-86	—	24-58
Mount Gambier ...	0-66	1-90	3-92	27-27
Meribah .....	—	0-63	—	20-37
Mindarie .....	—	0-31	—	—
Karoonda .....	0-02	0-83	—	31-46

# AGRICULTURAL BUREAU REPORTS.

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Aldinga .....	*	—	—	Frances .....	839	29	27
Amyton .....	*	—	—	Freeling .....	*	—	—
Angaston .....	*	—	—	Gawler River .....	*	10	16
Appila-Yarrowie ....	*	—	—	Georgetown .....	*	8	6
Arthurton .....	827	—	—	Geranium .....	831	29	27
Ashbourne .....	838	—	—	Gladstone .....	821	8	6
Balaklava .....	*	8	13	Glencoe .....	*	—	—
Balhannah .....	*	7	5	Glossop .....	†	—	—
Barmra .....	*	11	9	Goode .....	*	12	10
Beetaloo Valley .....	*	12	—	Green Patch .....	831	10	—
Belalie North .....	*	11	6	Gumeracha .....	*	10	—
Berri .....	833	12	10	Halidon .....	*	—	—
Big Swamp .....	*	—	—	Hartley .....	835	—	—
Blackheath .....	838	8	6	Hawker .....	*	11	9
Black Springs .....	821, 826	11	9	Hilltown .....	*	—	—
Blackwood .....	*	—	16	Hookina .....	816	6	11
Block E. ....	*	—	—	Inman Valley .....	*	—	—
Blyth .....	†	1	6	Ironbank .....	835, 838	8	6
Booleroo Centre ....	819	7	5	Julia .....	*	—	—
Borrika .....	*	—	—	Kadina .....	*	—	—
Bowhill .....	*	—	—	Kalangadoo .....	847	8	13
Brentwood .....	†	6	11	Kangarilla .....	*	7	12
Brinkley .....	833	8	6	Kanmantoo .....	*	8	6
Bundaleer Springs ..	*	—	—	Keith .....	*	—	—
Burra .....	*	—	—	Ki Ki .....	*	—	—
Bute .....	*	—	9	Kilkerran .....	†	6	11
Butler .....	831	10	8	Kimba .....	*	—	—
Cadell .....	*	—	—	Kingscote .....	*	—	—
Caltowie .....	*	—	—	Kingston-on-Murray.	*	—	—
Canowie Belt .....	*	—	—	Kongorong .....	840, 841	6	11
Carrow .....	*	6	4	Koonibba .....	*	6	11
Cherry Gardens ....	838	11	9	Koppio .....	*	10	—
Clanfield .....	*	—	—	Kybybolite .....	847	6	11
Clare .....	822	—	—	Lake Wangary .....	†	8	6
Clarendon .....	838	10	8	Lameroo .....	832	—	12
Claypan Bore .....	*	12	10	Laura .....	821	8	6
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Coomandook .....	*	—	—	Lone Gum .....	834	12	10
Coonalpyn .....	833	—	12	Lone Pine .....	826	—	—
Coonawarra .....	*	—	—	Longwood .....	†	—	—
Coorabie .....	*	—	—	Loxton .....	824	—	—
Cradock .....	*	—	—	Lucindale .....	*	—	—
Crystal Brook .....	*	8	6	Lyndoch .....	826	6	11
Cummins .....	*	8	6	MacGillivray .....	*	12	10
Cygnet River .....	*	6	11	McLachlan .....	828, 831	8	6
Dawson .....	*	—	—	Maitland .....	827	1	6
Denial Bay .....	*	—	—	Mallala .....	825	3	8
Dowlingville .....	*	—	—	Maltee .....	829	7	5
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		April.	May.			April.	May.
Meningie .....	*	—	—	Renmark .....	*	—	—
Meribah .....	*	12	10	Riverton .....	*	—	—
Milang .....	836	8	13	Riverton (Women's) ..	*	—	—
Millicent .....	†	1	6	Roberts and Verran ..	829	6	11
Miltalie .....	†	8	6	Rockwood .....	837	10	—
Mindarie .....	*	3	1	Rosedale .....	826	12	10
Minlaton .....	*	7	5	Rosy Pine .....	*	—	—
Minnipa .....	*	12	10	Saddleworth .....	*	—	—
Mintaro .....	*	8	6	S a d d l e w o r t h	*	—	—
Monarto South .....	832	8	6	(Women's) .....	*	—	—
Moonta .....	†	7	5	Salisbury .....	826	4	2
Moorak .....	841, 842	6	11	Salt Creek .....	*	—	—
Moorlands .....	*	—	—	Sandalwood .....	*	—	—
Moorook .....	*	—	—	Second Valley .....	845	1	6
Morchard .....	817, 819	8	6	Shoal Bay .....	*	—	—
Morgan .....	*	—	—	Smoky Bay .....	†	—	—
Morphett Vale .....	838	13	11	Spalding .....	*	—	—
Mount Barker .....	837, 839	12	10	Stockport .....	*	—	—
Mount Bryan .....	819	—	—	Strathalbyn .....	*	11	9
Mount Byran East ..	*	—	—	Talia .....	831	10	—
Mount Compass .....	*	—	—	Tantanoola .....	*	8	6
Mount Gambier .....	842	8	13	Taplan .....	834	—	13
Mount Hope .....	929, 831	8	6	Tarcowie .....	817	11	9
Mount Pleasant .....	*	—	—	Tatiara .....	846, 847	22	20
Mount Remarkable ..	819	—	—	Two Wells .....	*	—	—
Mundalla .....	*	12	10	Uraidla & Summertown	*	3	1
Murray Bridge .....	*	—	—	Veitch .....	*	—	—
Myppolonga .....	*	12	10	Virginia .....	825, 826	—	—
Myponga .....	*	—	—	Waikerie .....	*	—	—
Nantawarra .....	826	6	11	Wall .....	*	—	—
Naracoorte .....	843	8	13	Wanbi .....	*	—	—
Narriady .....	*	8	13	Warcowie .....	*	—	—
Narrung .....	839	8	13	Watervale .....	*	—	—
Neeta .....	*	—	—	Weavers .....	827	10	8
Netherton .....	834	—	—	Whyte-Yarcowie .....	*	—	—
North Booborowie ..	†	—	—	Wilkawatt .....	834	8	6
North Bundaleer .....	*	—	—	Williamstown .....	*	6	3
Northfield .....	*	12	10	(Women's) .....	*	—	—
Nunkeri and Yurgo ..	*	2	7	Williamstown .....	827	7	5
O'Loughlin .....	*	12	10	Willowie .....	818	12	10
Orroroo .....	*	—	—	Wilmington .....	818	12	10
Owen .....	824	14	12	Windsor .....	827	—	—
Parilla .....	†	—	—	Winkie .....	*	10	8
Parilla Well .....	*	10	—	Wirrabara .....	820, 821	—	—
Parrakie .....	*	—	—	Wirrega .....	*	—	—
Paruna .....	*	—	—	Wolowa .....	*	—	—
Paskeville .....	827	11	9	Wudinna .....	*	—	—
Penola .....	844	1	6	Wynarka .....	*	—	—
Petina .....	*	29	27	Yabmana .....	*	—	—
Pinnaroo .....	834	—	12	Yacka .....	*	11	9
Pompoota .....	*	—	—	Yadnarie .....	829	11	9
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Port Elliot .....	839	8	13	Yaninee .....	*	—	—
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Redhill .....	819	18	16	Yorke town .....	*	—	—
Rendlesham .....	845	12	10	Younghusband .....	833	13	11

\* No report received during the month of February.

† Held over until next month.

‡ Formal meeting.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

HOOKINA (Average annual rainfall, 12in.).

February 9th.—Present: six members and four visitors.

“WATER SUPPLY.”—Mr. P. B. Heneschke contributed a paper on this subject. A good supply of water, he said, was one of the most necessary items on a farm. He preferred the use of the dam, because it was more convenient, and there were no pumps to get out of order. The dams required very little supervision, but should be cleaned out occasionally. In selecting a site for a dam he favored a position where the catchment was good, but, he said, it was also advisable if possible, to choose a position where there would not be too much drift. A well or bore would also be necessary, because it was practically impossible to sink a dam that would hold enough water to tide over the dry spells to which the district was subject. He preferred a bore if the water was a long way from the surface, but a shaft if the water was only a few feet down. A force pump was to be preferred when attached to the shaft, because the cylinder type of pump was always losing a certain amount of water in the packing, with the result that it did not throw such a good stream. He thought the windmill was the best method of pumping water, because it could be run more cheaply and with less trouble than an engine. If the water was run into a large storage tank, the windmill would supply all the water that was required, but it was also very convenient to have an engine that could be used if there was a long spell of calm weather. During the discussion which followed, Mr. A. J. Lindblom advised making large dams provided good holding ground could be utilized. He also favored concrete storage tanks at wells or bores. Mr. S. Stone said he would not depend wholly on dams, but would put down a well or bore in case of a long dry spell. If first-class spring water was available he would not trouble to excavate dams if the country was inclined to drift.

HOOKINA (Average annual rainfall, 12in.).

March 9th.—Present: seven members and three visitors.

THE FARM WORKSHOP.—Mr. F. Cagney, in introducing a discussion on this subject, said no farm was complete without a workshop in which jobs such as repairs to harness, carpentering, and blacksmithing work could be carried out. With very little practice one would be able to do many of the repairs that were necessary on the farm. Any large and mechanical repairs that were required, he thought, should be given to a skilled tradesman. Referring to the repairing of harness, Mr. Heneschke said the sewing of the leather with needle and thread made a more serviceable and neater job than copper rivets. Mr. S. Stone thought that when repairing heavy leather straps both the rivets and thread should be used. He considered the blacksmith shop an essential to the successful working of the holding.



**MORCHARD (Average annual rainfall, 13.50in.).**

March 11th.—Present: 13 members and three visitors.

**PREPARATIONS FOR SEEDING.**—In the course of a short paper dealing with this subject, Mr. J. Scriven said the first work in connection with seeding was to see that all the implements required were in first-class working order; washers should be placed on the wheels, all nuts tightened, and the tyres made quite straight. He considered one should have a supply of shares on hand so that cultivating could be commenced immediately after the first rains had fallen. All harness should also be overhauled, repaired, and given a dressing of oil; and he suggested that all the seed should be cleaned, and a number of bags pickled beforehand. A fair quantity of hay should be chaffed to carry the team through the seeding, and a few days prior to the commencement of the work the horses should be brought into the stable and given one feed each day. Mr. Kupke, in discussing the paper, questioned the policy of pickling the wheat any great length of time before it was sown. Messrs. King and Lillecrapp also spoke.

**TARCOWIE.**

March 7th.—Present: nine members.

**COLT BREAKING.**—Mr. C. W. Davidson, who contributed a paper on this subject, said to make a thorough job of the work of breaking in the colt it was most necessary to exercise patience and common sense. Firmness meted out with kindness were also essential factors. He was of the opinion that it was a good plan to handle the foals when quite young; but he said he intended to deal with the animal that had not been handled until about three years old. Roughness should at all times be avoided, but at the same time the colt should be given to understand that the person breaking him in was his master. When attempting to catch the draught colt, the animal should be spoken to quietly and rubbed all over with a stick, and if that was carried out for a little while he would soon understand that he was not going to be hurt. After the animal had been caught, and the bit placed in its mouth, the colt should be left alone for a while until he became accustomed to the harness. The rein should not be hooked on to the bit at the start, but on to the nose ring of the halter. Next, the colt should be driven, first one way and then the other, around the yard, making an occasional stop to rub him, when he would soon have confidence in his master. To teach the horse to lead, the rein should be clasped close to the bit in the left hand, with the right hand holding the slack rein over the wither. Next a strong rope about 20ft. in length should be obtained, and each one of the animal's legs lifted in turn from off the ground. The handling of the legs should be persisted with until the colt master was able to lift the animal's feet off the ground without the aid of the rope. The next step was that of mouthing. That could be done by tying a piece of rein, loosely, from the tail to the bit. On the second day the same performance could be undertaken. The colt should then be fastened to a firm post with a strong piece of rope, to teach him to tie up. On the third or fourth day he should be ready to take his place in the team, which should be between two reliable and quiet horses. The team should be stopped occasionally, and the collar lifted from the shoulders of the young horse to prevent them from scalding. The light colt should be handled in very much the same manner, except that one should make a practice of getting on and off the animal from both sides, and sliding back over his rump. He should be taught to lead from the back of another horse, and the speaker favored the plan of mounting the colt inside the loose box. The horse should be trained to stand still whilst being mounted, the lessons being given by keeping the animal tied up to a post until he became used to the rider getting on his back. To break him into harness he should first be worked alongside of a reliable horse for a number of times, when he would soon learn to pull. It was considered advisable to put a kicking strap on the young horse the first few times that he was worked in single harness. In the discussion that followed, Mr. D. Smith thought the best plan was to work the young horse on the near side of the team, for if anything went wrong it was quite likely that considerable difficulty would be experienced in getting among the other horses. He also thought it would not be advisable to try sliding off the rump of the colt when the animal was being broken into saddle. Mr. J. J. McCarthy was of the opinion that the colt should first be taught to pull before being worked with the other horses of the team.

## WILMINGTON.

February 16th.

Mr. Tuckwell contributed a paper entitled "Time Saving on the Farm," which caused a good discussion. Messrs. Carlyon and George spoke of the convenience and usefulness of telephonic communication. Other members also spoke of the usefulness of that instrument, especially to tradespeople and farmers.

WILLOWIE (Average annual rainfall, 11.90in.).

March 9th.—Present: six members and visitors.

SEEDING OPERATIONS.—"If sufficient rain has fallen, I think seeding operations should be commenced early in April," said Mr. D. T. McCallum, in a paper under the above title. Continuing, he said the fallow should not be worked when it was in a dry condition, unless it was covered with a rank growth of weeds. Weeds such as paddy-melon, potato bush, &c., could be destroyed by going over the land once or twice with the harrows. If a combined cultivator and drill was used for sowing, he considered it advisable to give the land a subsequent working with the harrows. He considered that a bushel of wheat and from 60lbs. to 80lbs. of manure the right quantities of grain and super to use when drilling. Pickling should always be carried out, and he usually treated the grain in a cask, using 1lb. of bluestone to 9bush. of wheat, with sufficient water to cover the grain. If the land that had carried a crop the previous year was to be broken up, it should be worked before seeding operations commenced, so that weed seeds would germinate before the drill was used.

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**MOUNT REMARKABLE, February 24th.**—Several matters, including the forthcoming Conference of Mid-Northern Branches of the Agricultural Bureau, were brought forward, and an interesting discussion followed.

**TARCOWIE, February 7th.**—Mr. J. J. McCarthy contributed a paper, "Eyre Peninsula and the Conditions Prevailing Thereon." The paper dealt with the general agricultural conditions of the Peninsula.

## MIDDLE-NORTH DISTRICT.

### (PETERBOROUGH TO FARRELL'S FLAT.)

**BOOLEROO CENTRE (Average annual rainfall, 15.83in.).**

March 10th.—Present: 14 members and visitors.

**WORKING THE FALLOW.**—Mr. A. Whibley, who contributed a paper on this subject, said after the land had been broken up the harrows should be brought into operation immediately after the first shower of rain. Cultivating, he thought, should only be adopted if the land had become firmly set or if there was a lot of rubbish growing on the soil. If the fallow was worked during late spring, stinkwort would only cause trouble in the event of heavy rain during the harvesting months. Should that occur, the disc cultivator, in his opinion, was the only implement that could successfully deal with the stinkwort. Dry working of the land was certainly better than allowing the weeds and rubbish to grow unchecked. The farmer who had a fair acreage devoted to fallow should work the harrows at every opportunity, especially after rain had fallen. Messrs. Michael, Stephens, Paterson, Smith, Innes, Berry, and Carey took part in the discussion that followed. The delegates to the Conference of Mid-Northern Branches furnished a report of the proceedings of that gathering.

**MOUNT BRYAN (Average annual rainfall, 15.81in.).**

February 18th.—Present: seven members.

Mr. A. A. Jefferies read an interesting paper, "Time and Labor Saving Machinery on the Farm," in which he traced the progress that had been made in the manufacture of agricultural machinery. Special prominence was given to the strides that had been made with internal combustion engines, and the speaker expressed the opinion that in a few years' time tractors would further assist the farmers in lightening the work of sowing and harvesting the crops.

**REDHILL (Average annual rainfall, 16.79in.).**

March 14th.—Present: 12 members.

**HORSE MANAGEMENT.**—The Hon. Secretary (Mr. S. A. Pengilly) contributed a paper on this subject. Opinions differed, he said, regarding the treatment of horses during the summer months. Large numbers of practical men thought that if an animal was sound and only required a brief period of rest, he would enjoy himself more and do better if he passed his holiday in a loose box than if he was turned out on grass, but there were very few farmers who had a box at hand for the accommodation of each horse that required a rest. When horses were given a rest he thought it was necessary to bring them in for a few hours during the heat of the day if it could possibly be arranged, because they would then be removed from continual annoyance by flies as well as from the heat of the sun. The horse would benefit more by being out during the night than by day, because the grass was then at its best, and the feet would benefit by the dew. During the past few months horses that had been pastured on grass had put on condition, but it was noticeable that where housing accommodation was available the stock invariably used it during the heat of the day and grazed in the paddocks when it was cooler. Fields without natural shade should be provided with rough shelters,

and the animals should have free access to water at all times. The advisability of feeding working horses with green feed during the summer months was a point upon which owners differed, but, provided the work was not of an arduous nature, not only was feed such as clover, vetches, and tares, much appreciated, but the blood would be cooled and the bowels relaxed. Care should be taken not to give wet grain forage of any kind to the animals. Green fodders, such as clover and tares, should be chaffed and mixed with the daily allowance of corn and chaff. Horse breeding to become a successful enterprise required a great deal of experience and knowledge, and the breeder should understand the pedigrees of the dam and sire. Matters of importance would arrive at every operation of breeding from mating to foaling. However well selected the animals were, the prospect of securing a foal might be blighted at the outset by the mare refusing to breed. Sterility was the most prevalent and ruinous condition pertaining to a breeding stud. The usual accommodation which was found on a number of farms was altogether unsuited for breeding, especially when the breeding of horses was to be one of the principal operations on the farm. It was absolutely necessary to have commodious loose boxes for brood mares and young stock. Foaling boxes should be conveniently placed in quiet situations, and fitted with a system of lighting to enable a person to watch his charge. Mares were very shy and sensitive, and there should be no necessity for continually opening the door, and thereby disturbing the occupant. Small paddocks should be provided with sheds, so that the young stock would get plenty of exercise and fresh air. The nature of the ground on which the foals roamed had an influence on their feet. A sandy, clay soil had been found by experience to be the best for light horses. A light sandy soil or marshy ground caused defects in the hoof and soft pasterns. Before the young horses were put to work they should be taught to become accustomed to the use of the brush and curry comb, and frequently be made to lift their feet in preparation for shoeing. The hoofs should be examined at intervals of six or eight weeks, and parts that were growing out of proportion should be cut down. It was to the farmer's interest to see that his horses were kept fit and well, so that they could work full time during harvest. A good discussion followed the reading of the paper.

**WIRABARA** (Average annual rainfall, 19.44in.).

February 11th.—Present: 14 members and visitors.

**SHEEP ON THE FARM.**—Mr. T. A. Stead, who read a paper dealing with this subject, said time was when the keeping of sheep was regarded as a side line by the majority of farmers, but of late years agriculturists had come to the conclusion that it was hardly possible to carry on farming without a flock of sheep. Not only did the animals assist in enriching the soil and keeping it free from weeds, but they made a very welcome addition to the revenue of the farm through the disposal of their wool and mutton. The foundation of the flock was one of the most important points, and the farmer, having decided on the breed that he intended to keep, should purchase a few good ewes and a ram from some reputable breeder. He favored the Merino as the best all-round breed for the farmer. To obtain best results, no more than 50 ewes should be allowed one ram. If more than that number was allotted, an uneven lot of lambs would be the result. The best plan was to arrange for the drop to take place when plenty of green feed was available. As lambing time approached the ewes should be placed in a good, warm paddock, with plenty of feed, and watched very closely. Tailing should be done when the lambs were about six weeks old, and if a suitable day was chosen for the work, and disinfectant used on the knife, few deaths would occur. All sheep should be looked over once in a while, and any filth removed. That would keep the wool clean, and there was also less danger of blowflies attacking them. When such happened, a mixture of tar and kerosine should be used. Many farmers made a practice of keeping sheep on fallow that was bare of feed, making them do some of the work that should be done by the cultivator. That was a mistake, for if the sheep were put on short allowance a break in the wool resulted, and that meant a loss of profit to the farmer. "Treat your sheep in a proper manner, and you will find that they will treat you well, both in yield of wool and weight of mutton."

**WIRABARA (Average annual rainfall, 18.91in.).**

March 11th.—Present: 17 members.

**SOUNDNESS IN BREEDING STOCK.**—Mr. W. Stephens, who contributed a paper on this subject, said the main points in a horse were health and durability. He was of the opinion that all stallions entering a show ring or advertised for stud duties should be in possession of a certificate of soundness, for the man on the land would then be in a position to secure the use of the best sire. Only the sound, robust, and quiet-tempered mares should be mated with the stallion. In regard to dairy cattle, he was of the opinion that no milch cow should be eligible to compete in any show or milking test as a dairy cow without having a certificate of soundness; she would then be an asset to the district, not only for produce, but for breeding sound and saleable stock. The bull should be carefully chosen, and show good breeding points and possess a certificate of soundness. During the discussion which followed, Mr. Stephens mentioned that he considered the care and attention of all stock breeders was necessary toward getting the best animals. Members were also in favor of the certificate for stallions being made to cover a wider scope in regard to soundness internally as well as externally.

**GLADSTONE, February 11th.**—Several matters of local interest, including "Wheat Varieties," "The Locust Plague," and the forthcoming Conference of Mid-Northern Branches, were brought forward for discussion.

**LAURA, February 11th.**—Mr. E. G. Blessing contributed an interesting paper, "A Retrospect of Last Season." An interesting discussion followed, in which Messrs. J. G. Richardson, F. T. Hughes, J. Roennfeldt, F. B. Roennfeldt, and J. Warr took part.

**LOWER-NORTH DISTRICT.****(ADELAIDE TO FARRELL'S FLAT.)****BLACK SPRINGS.**

February 14th.

**COWS ON THE FARM.**—"The cow is a necessity on every farm, and a most profitable side line," said the Hon. Secretary (Mr. C. M. Hudd), in a paper on the above subject. The speaker expressed the opinion that a farm was not complete unless it had at least four good dairy cows; but he realised that the size of the holding and the amount of labor available were two very important points that had to be taken into serious consideration. He held the view that the Jersey was the best cow for the farmer, and if four good animals of that breed were kept, and given proper care and attention, £10 profit per cow per annum should be received. The Jersey did not require such a large quantity of feed as some of the larger breeds of cattle. It was often stated that the Jersey would not thrive in cold localities, but he considered that no matter what breed was kept, the animals would not thrive unless they were provided with ample shelter against the cold and hot winds. The feeding of the cows was one of the most important points in the profitable raising of dairy products, and when the flush of the green feed had gone off, the animals should be fed on hay chaff, with bran or crushed oats. Still better results would be obtained if a patch of lucerne was kept for summer feeding.

**PIGS AS A SIDE LINE.**—In the course of a short paper on this subject, Mr. T. R. Mann said he had found the Berkshire pig a very profitable side line on the farm. For a bacon pig, he suggested the Berkshire crossed with the Mid-York. The ultimate success of the pigs depended to a very large extent on the methods that were adopted in the feeding of the animals, and he thought that a small piece of land devoted to lucerne would minimise the cost of raising to a very large extent. Particularly good results would be obtained if the breeding sow was allowed the run of the lucerne plot. A month before farrowing the sow should be separated from the other pigs and given a little extra corn. The young pigs, if given a liberal supply of green lucerne, would thrive and keep in good health. Good health was most essential, and it was important to see that the styes were kept dry and clean.

CLARE (Average annual rainfall, 24.30in.).

January 13th.—Present: 15 members and three visitors.

**CONTINUOUS GRAZING.**—The following paper was read by the Hon. Secretary (Mr. W. H. Lewcock):—"The treatment of grass land, either temporary or permanent pasture, on a farm is of as much importance as the preparation and working of the fallow. The fallow is kept clean and in good condition, and at seeding time artificial manures are sown with the seed to help to improve the yield. The grass land usually has no attention whatever, being fed off with stock, either cattle, sheep, or horses, and no notice is taken whether the quality or character of the feed is deteriorating or not. It is known that grazing grass land does improve its fertility to a certain extent, but where sheep or cows are kept continuously grazing, the grass paddocks will ultimately seriously affect the pasture, the natural native grasses being eaten out, and other grasses and weeds take their place. In the production of milk and wool, the cow and sheep extract from the feed certain elements which, when the grass paddocks are kept grazed down continuously, will ultimately become exhausted from the soil, the demand upon the supply being greater than nature can supply. The question as to the kind and quality of manure to use is one which the farmer must settle for himself. The condition and location of his pasture have the first consideration. The use of lime alone often has a very marked effect. Soils that are inclined to be sour need lime to sweeten them. The action of lime on pastures sweetens the soil, renders potash, nitrogen, and other plant foods available, and often quite changes the character of the herbage. The effect of a phosphatic manure, such as ordinary mineral super, will, where it is needed, often entirely change the character of vegetation without any seed being sown. Again, the quality and character of the feed is much improved. Stock will feed off the strip or paddock that is top dressed with super much more readily

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than that unsown. The farmer can test this for himself by top dressing certain strips of pasture in his paddock, and closely watching where the stock most often feed. The quantity to apply depends upon conditions that the farmer himself must consider—cost, &c. In this district from 1cwt. to 2cwts. would give very good results, though smaller quantities would prove beneficial. The best time to apply is in the autumn, any time before or soon after the rainy season starts. One of the effects is to force early feed, and the reason for early application is evident. We have ourselves practised top dressing during the last two years. The first year only a portion of the paddock was dressed, and that late in the season. Garden manure was used, about 1cwt. per acre. The cows were very partial to that particular portion. The feed showed improvement both in quantity and quality. This last season we again top dressed. This time the whole paddock was treated. The results are not quite so marked this season, because of the wet, cold conditions prevailing during the early part of the spring. The cows, however, still show a preference for the previously dressed portion to most of the other parts of the paddock, excepting perhaps on the flat, where couch grass has obtained a hold. The summer rains that we have experienced have greatly benefited that, and the cattle have accordingly appreciated it. The manure may be applied broadcast by hand. Choose a calm day, or it can be sown by an ordinary drill with the hoes on. This, however, does not give such an even distribution. A light dressing may be given with the aid of an ordinary broadcast wheat sower, but a calm day must be chosen, because of waste by wind. It is stated by those who have made a study of these subjects that even land upon the resources of which no great tax is made will diminish in fertility if nothing be done to replace what is extracted from it. The drain upon fertility may not be severe, but it is continuous, and seeing that the original available essentials are limited in quantity, exhaustion cannot be indefinitely postponed. If this method of reasoning applies—and none can gainsay it—where the drain upon the nutriment is light, how much more force does not the argument carry when year in and year out the utmost possible is being extracted? In connection with the carpet-like appearance of some paddocks many landholders may point to a close-set covering as evidence that their feed is as good as ever. These men fail to take particular notice of the component parts of that covering. Inferior herbage and rank and ill-nutritious plants may be taking the place of better grasses. The fact that one class of plant will thrive where another has starved is regarded by the scientist as proof positive of something amiss in the fertility of the land. The increase of bracken is held to be a proof of deterioration, and may in this respect at least commend itself in a new and evil light to pastoralists in the South-East. Bracken or any other grass feeding plant may find sufficient sustenance in soils that have ceased to supply the balance of ingredients necessary for the better (i.e., more nutritious) grasses. Nothing is easier or more simple than to neglect grass lands without seeing any ill effects, and in consequence the feeling is paramount that grass land can take care of itself. It is the practice of nearly all owners to leave their grass land very much to itself, but that is no reason why what has proved to be deleterious should be continued. Having regard to the magnitude of pastoral industry in the grass districts of the State, any change for the worse should occasion serious apprehension. There are limitations to the amount that can economically be expended upon grazing land, and it may be beyond the resources of the occupiers of some grass lands to attempt to do more than restore the former fertility of their land. But there are many men in this State who own grass land that will now carry two sheep to four acres, who were seldom satisfied with it in the past if it did not support two sheep to three acres. Landowners and farmers having land of this description can afford not only to restore, but to improve upon the former fertility. They have a basis upon which to work in handling the economic aspect of the question. Methods of renewing the fertility of the grass land by temporary cultivation have received practical demonstration by farmers scores of times, and this class as a rule pin their faith to this method only. The sheep raiser and grazier, pure and simple, is the main offender. He pursues a policy of inaction, and will probably continue to do so until he receives some rude awakening. As likely as not, this will take the form of discovering that a neighbor of a more progressive nature is carrying more sheep, and growing better wool than himself, or has been used to, entirely in consequence of a judicious expenditure upon the disintegration of hard bare patches, the sowing of grass seeds, and

surface dressing with some fertiliser. Another drawback to continuous grazing is the difficulty that is often experienced in inducing stock to eat off the coarse, rank grass that always springs up where stock excrement has accumulated. This rank growth needs attention from the harrow, the use of which has the effect of spreading the droppings. Rich grass land where such tufts abound even warrants such attention to detail as the use of the scythe. The new growth of after-grass comes away fresh and sweet, and is readily eaten down by sheep. Even in the process of growing wool, a constant drain upon certain essentials in the land is going on. This cannot continue interminably, and he is a wise man who recognises the fact, and is setting to work upon the task of restoration. The particular form of manure to be applied need not be discussed here. It is the establishment of the principle that is immediately important. Some lands require one treatment, some another, a dressing of lime, or a judicious application of phosphates. Many acres of land, even in a single paddock, have ceased to serve any useful purpose. They have become hard, bare patches, and the hardness and bareness are a direct evil influence on the sheep, aided by the wind. Few attempts are ever made, even to the extent of using scarifier and harrow, to bring back a surface that is capable of detaining the ever-drifting seed of native grasses. The carrying capacity of all grass lands has in respect of these bare patches alone suffered very materially. How much that capacity has suffered from a gradual failing of certain essentials in the grass itself can only be brought home to practical men by practical experiments. Much labor and money are annually expended upon arable land in this State, but, with rare exceptions, grass land receives no assistance at all. Practically speaking, the grass land is left severely alone, year after year, and decade after decade, to fend for itself. Up to a certain point it can be generously conceded that stocking improves pasture, and in no direction is this move more noticeable than in the drier areas to the north of Goyder's line of rainfall. The improvement has taken form by the introduction of numerous southern grasses borne along in the seed stage by travelling stock. In like manner the indigenous grasses of the State south of the line of demarcation have been largely supplemented by contributions of the trefoil order from other parts."

A homestead meeting was held at Sevenhills College on January 14th. There was a fair attendance of members and visitors. After an inspection of the college vineyards and cellars, the party were regaled with light refreshments. A hearty vote of thanks was accorded to Father McCarthy and Bro. Boehmer.

#### OWEN.

March 17th.—Present: 13 members.

**SELECTION OF SEED AND PREPARATIONS FOR SOWING.**—In the course of a paper dealing with this subject, Mr. J. S. Lake said first consideration should be given to the class of land on which it was intended to sow the wheat crop, because very few paddocks contained a soil of even quality from fence to fence. Roughly speaking, land could be divided into four or five separate classes:—Heavy clay lands, sandy loam, limestone, and sandy rises. Selection of seed meant, as a rule, choosing a single head of grain from one particular variety and gradually working up a type of wheat; but such a practice, he thought, could not be recommended to the average farmer. The main point for the farmer to remember was that he should sow the variety of wheat best suited to the class of land that predominated on his holding. He suggested that on the lighter or high lands, with the exception of limestone soils and sandy rises, a wheat such as Major, which yielded well on a light straw, might profitably be sown, while the wheats that gave maximum results on a heavy straw should be sown on the heavier lands. For limestone rises, oats were recommended, while for sand rises barley, preferably malting varieties, had an undoubted claim. The next question for the farmer to consider was the preparation of the seed. The first process, i.e., grading or winnowing, should be done carefully, and with a view of securing only the best grain. Too often results were overlooked in favor of expediency. The careful farmer had his eye only on the result of his work. Every farmer required a certain amount of grain for feeding to the fowls and pigs during the year, and if a liberal quantity of seed was reserved, he could grade fairly heavily, and thereby secure plenty of pig and poultry feed, and leave himself a first-class sample for sowing at the same time. Various devices could be obtained for picking, but the cheapest and



handiest — the barrel method. If, when winnowing, the bags were filled to ~~about~~ about 130lbs. or 140lbs., and then sewn, they could easily be handled by one man in the pickling process. The barrel should be kept continually replenished with a 1 per cent. solution of bluestone, and the bag thoroughly immersed and moved about until all bubbling ceased; the results would be quite satisfactory. As to the length of time wheat should be treated before sowing, there seemed to be no hard-and-fast rule, but the wheat should have time to dry thoroughly in the bag before being put into the drill. Finally, all precautions should be taken to prevent wheat from being exposed to rain or damp; and, what was still more important, the wheat should be kept from the attack of weevil. In the discussion that followed, Mr. R. S. Harkness thought the only way to maintain a pure standard of wheat was by selection, or to obtain a change of seed from other districts. He was not of the opinion that pickling in the bag was the best method. He thought the bucket and shovel method most effective. He was of the opinion that relatively light sowings with good seed were better than heavy sowings of poor-quality seed. He had seen 42bush. to the acre reaped when only 48lbs. of seed had been sown to the acre. Mr. I. T. Freebairn did not advise heavy seeding. He also stated that farmers should be sure and get clean seed when importing it. Mr. T. A. Freebairn stated that great care should be taken when grading the wheat. Mr. H. A. Helps thought the method of dipping the bag in bluestone very effective. Mr. W. J. Marshman said care should be taken in reaping seed, as the grain was sometimes cracked and would not germinate. He favored mid-season wheats, as they were the most consistent. He did not favor dry sowing; better to sow late wheats last. Neither did he agree with pickling in the bag.

#### MALLALA. (Average annual rainfall, 16.58in.).

February 6th.—Present: 12 members and two visitors.

Mr. R. C. Scott (Assistant Lecturer and Demonstrator in Agriculture at the Roseworthy Agricultural College) was present, and delivered an address, "Cultivation of the Soil."

At a further meeting, held on March 6th, Mr. G. A. Franks read extracts on the subject, "Poultry on the Farm," and an interesting discussion followed.

#### VIRGINIA.

March 8th.—Present: 28 members.

THE FARM LABORER.—In the course of a paper on this subject, Mr. T. O'Loughlin considered that in many cases the employee on the farm did not receive the same concessions as the workers in almost every other walk of life. The employee that was a constant general hand was expected to be able to handle any piece of machinery and make himself acquainted with all the general work of the farm. He recognised that during harvesting and seeding the employee should not expect concessions, but even then the employer should not expect any man to work more than a reasonable number of hours, nor work so hard as to injure his health. The casual laborer, who was only employed during a short period of the year, should only be worked reasonable hours, and paid considerably more than the ordinary wage of the day, for so soon as the busy season was over he had to seek employment elsewhere. On the other hand, the employee should first make himself acquainted with all the necessary work on the farm, and give an adequate return to the farmer for his hire. If his employer was called away at any time, he should carry on the same as if the farmer were present, and should he finish the particular job he was engaged upon he should not idle his time away, but turn his hands to some other useful work. That would make for a better feeling between master and man. In the discussion that followed, Mr. J. A. Ryan thought that the farm laborers of to-day had a much better time than those of years ago. In those times a man had to walk behind every implement for a mere pittance, but to-day he was able to ride on nearly every implement. They used to have to work from dawn until dark and receive little, but now the hours were defined to a considerable extent. Mr. Hall expressed the opinion that the farm laborer was

the worst paid servant in the Commonwealth. Mr. Wright said he was under the impression that some different system to that of paying wages was needed to create interest in the men. The speaker said that if he adopted farming he would give a bonus, or share his profits with his men, and in that way stimulate an interest. In reply to a question, Mr. O'Loughlin suggested that a man should leave the stable with his team at 7 a.m. to 7.30 a.m., and return before sundown at night, and during harvesting operations from 7.30 in the morning to 6 o'clock in the evening.

**BLACK SPRINGS, March 14th.**—The Instructor for Mallee Lands (Mr. C. P. Hodge) attended the meeting and delivered an address, "The Value of Sheep on the Farm."

**LONE PINE, February 7th.**—The Manager of the Turretfield Government Farm (Mr. F. Waddy) attended the meeting, and delivered an address, "Does it Pay to Specialise?"

At a further meeting, held on March 14th, a short paper, "Winemaking," was contributed by Mr. G. Braunach. A report of the exhibit staged by the Branch at the Royal Show was tendered by the Chairman (Mr. A. C. Lehmann).

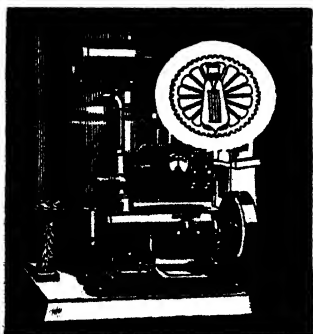
**LYNDOK, March 9th.**—The Assistant Dairy Expert (Mr. H. J. Apps) attended the meeting and delivered an address, "The Dairying Industry." A simple and reliable method of tying up a horse was demonstrated by Mr. S. G. Bishop.

**NANTAWARRA, February 9th.**—Several subjects of local interest were brought before the meeting, and delegates were appointed to attend the meeting of the Northern Yorke Peninsula Field Trial Society. The following average yields of wheat for the district were supplied:—Smut Proof, 18bush.; Gluyas, 12bush.; King's, 9bush.; and Major, 12bush.

**ROSEDALE, February 14th.**—On the occasion of the annual meeting, the report of the work performed by the Branch during the past year and the balance-sheet were presented by the Hon. Secretary (Mr. F. H. Wolf). The report showed that during the past year 10 meetings had been held, with an average attendance of 13 members.

**SALISBURY, March 7th.**—The meeting took the form of a "Question Box," when several subjects of interest to agriculturists were brought forward and discussed.

**VIRGINIA, February 8th.**—Mr. W. M. Wright contributed a paper, "The Smyrna Fig," and an interesting discussion followed.



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**WILLIAMSTOWN (WOMEN'S),** March 1st.—A member contributed a paper, "Kitchen Gardens," and an interesting discussion followed.

**WILLIAMSTOWN,** March 10th.—On the above date the Assistant Dairy Expert (Mr. H. J. Apps) delivered a lecture, "Diagnosis of Diseases of the Cow and Milk Production," to a gathering of 36 members and visitors.

**WINDSOR,** March 7th.—The Superintendent of Experimental Work (Mr. W. J. Spafford) attended the meeting, and discussed with members the question of conducting experimental plots in the district in conjunction with the Branch.

## YORKE PENINSULA DISTRICT.

(TO BUTE.)

**ARTHURTON,** March 13th.—Matters in connection with the forthcoming Conference of Yorke Peninsula Branches of the Agricultural Bureau, to be held at Moonta on April 12th, were brought before the meeting. The yields of different varieties of wheat were also discussed at length.

**PASKEVILLE,** February 7th.—A discussion took place on the question of boy immigration into Australia. Several other matters of interest to the Branch were also discussed.

**PASKEVILLE,** March 7.—Several subjects of local interest were brought forward for discussion. An opportunity was taken of saying farewell to Mr. J. P. Pontifex (late Secretary of the Branch), who was leaving the district for a trip to England. Mr. Sykes (Chairman) presented the departing member with a small token as an appreciation of the work Mr. Pontifex had performed for the Branch.

**MAITLAND,** February 27th.—On the above date the Government Veterinary Surgeon (Mr. C. A. Loxton, B.V.Sc.) gave a veterinary demonstration in the afternoon, and delivered a lecture in the evening, "Common Ailments of Stock," to a large attendance of members and visitors. At a further meeting, held on March 4th, matters of local interest were discussed.

**APPRECIATION OF SERVICES RENDERED.**—The resignation of the Hon. Secretary (Mr. C. A. Pitchers) was received on account of his leaving the district. Mr. Pitchers has held the position of Hon. Secretary for 16 years, and during that period has not missed one meeting of the Branch. It was decided to place on record his valuable work and untiring energy in the interests of the work of the Branch.

**WEAVERS,** February 13th.—The Hon. Secretary (Mr. L. A. Slade) read a bulletin by Mr. F. E. Place entitled "General Management of Farm Horses." During the discussion which followed, the chairman mentioned that it was practically impossible to comply with a number of the conditions mentioned, because, owing to the scarcity of labor, practically every farmer had to manage and work teams of from 10 to 12 horses, in addition to the various other duties of the farm. Mr. A. P. Anderson thought that sore shoulders were entirely due to carelessness, and that with thorough observation and good management, farmers would be able to overcome the difficulty. Mr. H. Bishop was of the opinion that backbands were one of the solutions of the difficulty, because they maintained the correct position of draught under all conditions.

**WEAVERS,** March 14th.—Extracts were read from the departmental bulletin, "Manures in their Relation to Present Day Farming," by the Hon. Secretary (Mr. L. A. Slade), and a lengthy and interesting discussion followed.

## WESTERN DISTRICT.

## COLLIE.

March 4th.—Present: 11 members and five visitors.

**HANDFEEDING OF SHEEP.**—In the course of a paper dealing with this subject, Mr. J. Lynch said as it was more than likely that better facilities for marketing the stock in that district would shortly be inaugurated, farmers would do well to give serious consideration to the fat lamb industry. Oats were generally recognised as a good crop to follow wheat, and it was invariably found that two or three self-sown crops would result without any cultivation. With 900 sheep on a block of 1,000 acres, the speaker was of the opinion that very profitable results would be obtained if handfeeding, with the uncleaned oats, was resorted to for, say, three months of the year. If that was done he had no hesitation in saying that more profit would be received by the farmer than from a 75 per cent. production of grain for marketing. The cultivation required to keep the weeds in check would be reduced to a minimum, and the fertility of the land would be considerably increased. In the discussion that ensued, doubt was expressed by Mr. A. P. Rowen as to the advisability of handfeeding sheep solely on oats. Mr. Dodgson thought that it would take more than one quart per day per sheep to keep the animals in good condition. Mr. P. P. Kenny agreed with the principles as outlined by the speaker, but he thought it would yet be some considerable time before it would pay to adopt the handfeeding of sheep in their district. Mr. A. Rowen quoted an experience of feeding lambs for three months after the time of weaning; 32 lambs were fed on oaten hay, the ration being nine sheaves every 24 hours. The lambs maintained excellent condition, and only a few minutes each day was required to attend to their wants.

## McLACHLAN.

February 11th.—Present: 10 members.

**LESSONS TO BE LEARNT FROM LAST SEASON.**—In a paper on this subject, the Chairman (Mr. W. Hawke) said that the rainfall for the season was ample to grow an average crop of wheat, but the average yield for the district was below normal. He attributed that to the following factors. During January, February, and March, over 7ins. of rain fell, which, at that time of the year, was harmful, because it interfered with the successful burning of scrub on new land. Those persons with fallow were tempted to rework it after the summer rain, which, he thought, was the reason why take-all was prevalent, and the lightness of the soil in that district made the practice a very risky one. The unworked fallow in that district was overrun with weeds, chiefly with thistles, which, at seeding time, seemed to thrive on cultivation, and undoubtedly choked out the wheat plant over large patches. On second and third crop land a splendid crop of self-sown wheat was in evidence, and one working did not suffice to kill that. There were places where it choked out the sown crop altogether. Self-sown wheat developed rust early, which could be found plentifully from May onwards, and whilst weather conditions, as a whole, were not favorable to a widespread devastation by this fungus, practically every farmer suffered more or less. He thought a larger proportion of rust-resisting wheats could be grown in that district, such as Queen Fan, Budds, and Early Gluyas, and considered that it would be wise not to touch the fallow after October, especially on the lighter classes of soil. Now that the Eyre Peninsula Co-operative Company was practically an accomplished fact, it behoved farmers in the district to push on with the fencing of the farms, with a view to keeping sheep and going in more for mixed farming generally. Sheep not only cleaned the land and saved a lot of team work, but they also increased the fertility of the soil, and there was also the profit from the wool and lambs. He favored Mr. W. J. Colebatch's (Principal of the Roseworthy Agricultural College) idea of growing oats as a second crop to check the take-all, and feeding it to the sheep, or harvesting it as seemed most profitable. During the discussion which followed, members were of the opinion that dry working was the cause of take-all, especially after three years' cropping.

**MALTEE.**

February 10th.—Present: six members.

**WHEATS SUITABLE FOR DISTRICT.**—The meeting took the form of a discussion on this subject. Messrs. L. Martin, R. Edson, and J. Talbot reported having sown Smut Proof for a number of seasons and found it to be free from smut. In a discussion that took place on the best cultural methods, members agreed that as larger areas of scrub were rolled and burnt off, bare fallowing would have to be resorted to in order to obtain the maximum yields from the land. Referring to the best wheats for the district, Messrs. Martin and Barnett favored Late Gluyas. Other varieties mentioned as having given good returns were Improved Gluyas, Queen Fan, Federation, and Smut Proof.

**MOUNT HOPE.**

March 18th.—Present: five members.

**SEEDING.**—A paper on this subject was contributed by the Hon. Secretary (Mr. H. F. Myers), who said that most of the land in their district could be divided into two classes:—(1) Stubble land that had just carried a crop; and (2) land that had been lying idle for a number of years. If the stubble was thick enough to carry a fire no trouble would be experienced in burning, but if only a thin stand of straw was obtained from the preceding year's crop, the fire rake would have to be brought into service. A good stubble burn was very valuable to the mallee farmer, for besides checking and destroying the growth of the mallee shoots, the fire seemed to have a sweetening effect on the soil. After the stubble had been burnt, he advised leaving the stubble until after rain had fallen, when the harrows should be used. A subsequent cross harrowing should destroy most of the weeds. On land that had been left idle for a number of years it was first necessary to deal with the shoots by cutting them. He was of the opinion that the later the cutting and burning of the shoots was left, the better would be the results obtained. Land of such a character as that mentioned in the preceding paragraph was best dealt with by ploughing when dry, and then using the cultivator or harrows when weeds rendered it necessary. The speaker favored sowing 1 bush of seed and about 60lbs. of super to the acre. In the discussion that followed, Mr. G. A. Vigar stated that cropping stubble was not a successful venture on the average coast land, on account of the prevalence of weeds. He advised sowing the wheat immediately after the first rains, and thought the disc harrows should be used in front of the drill and the harrows after seeding was completed.

**ROBERTS AND VERRAN.**

March 9th.—Present: six members and visitors.

**MIXED FARMING.**—Mr. B. Evans read a paper dealing with this subject, and in the discussion that followed Mr. A. T. Cowley expressed the opinion that wheat-growing alone was not a payable proposition, but, combined with stock-raising and a proper system of crop rotation, good returns could be obtained. He favored the Merino sheep for the farmer, and thought the Jersey an ideal dairy cow for the needs of one household. In reply to a question regarding ensilage, Mr. Evans said the construction of the silo was not such an expensive item as many farmers thought; either a stack, pit, or overhead silo would be found to meet the requirements of the average farmer.

**YADNARIE (Average annual rainfall, 14.09in.).**

February 7th.—Present: 16 members and two visitors.

**POINTS FOR THE CONSIDERATION OF THE FARMER.**—In the course of a short paper under the heading, "Forecasts," Mr. J. E. Quick expressed the opinion that the adoption of a successful system of crop rotation was most essential for the best working of the farm. With the prospects of the erection of a freezing works at Port Lincoln, farmers, and particularly those whose properties were suitable for the carrying of sheep, should give earnest consideration to the production of suitable lambs for the export trade. Practically the same could be said of the dairy-

ing industry, for the produce would be handled through the same co-operative channel. The adoption of better methods of feeding the stock, herd testing, and the proposed legislation to make the registration of bulls compulsory should place the dairying industry on a solid basis. Other topics, including the purchase of stock and machinery and water conservation, were also dealt with by the speaker. An interesting discussion followed, in which the views of the writer were upheld by those present.

#### YEELANNA.

February 11th.—Present: 14 members.

**FIRE RAKING.**—In the course of a short paper dealing with this subject Mr. R. A. Wemyss expressed a preference for the rake with flat iron teeth and high wheels, chiefly because the teeth were not easily bent. The fire rake was a most

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necessary implement in the equipment of the mallee farmer, for in addition to saving a good deal of labor, it cut the bushes and destroyed a large number of shoots. In the discussion that followed opinions were divided regarding the merits of both the flat and round toothed rake.

#### YEELANNA.

March 11th.—Present: 13 members.

**PREPARING FOR SEEDING.**—Mr. T. C. Smith contributed a paper on this subject. Every farmer, he said, should have sufficient seed of all varieties stored away ready for use. All the seed should be well graded and true to type, and it would repay the farmer for the little extra trouble it involved. The screenings, small grains, etc., could be saved for the fowls, and only the best grain sown through the drill. He advocated a dressing of 100lbs. of 36 per cent. super per acre on the soil in that district, and on fallow land even a heavier dressing could be applied. One of the most important items was the preparation of the ground for seeding. Fallow land should be worked down to as fine a tilth as possible, and all stumps and bushes taken out and burned in readiness for seeding as soon as weather conditions were favorable. Land that had been idle for a year or two should be burnt, if possible, with a grass fire, but if the bushes were too thick and the grass too thin, logging and fire raking would have to be resorted to. Stubble land also needed burning, and if a good burn was secured the prospects of the succeeding crop would be considerably enhanced. All machinery should be overhauled in readiness for seeding operations. During the discussion which followed, members were of the opinion that better preparation of the soil, grading of seed, a liberal dressing of super, and a grass or stubble fire would mean higher yields, and repay the farmer at harvest time for any extra work that had been involved.

**BUTLER, March 6th.**—Mr. C. F. Jericho presented the annual report of the local experimental plots. A lengthy discussion followed, in which members agreed that the plots should be fenced and each plot stocked in proportion to what it would carry.

**GREEN PATCH, February 28th.**—A special meeting of the Branch was held on the above date, when the Instructor for Mallee Lands (Mr. C. P. Hodge) delivered an address, "The Growing of Fodder Crops."

**McLACHLAN, March 11th.**—A paper, "Settling Immigrants on the Land," was read by the Hon. Secretary (Mr. W. F. Attrick), and an interesting discussion followed.

**MOUNT HOPE, February 18th.**—An account of the meeting of shareholders of the Eyre Peninsula Co-operative Company, recently held in Port Lincoln, was given by Mr. G. A. Vigar.

A special meeting of the Branch was held on February 23rd, when the Instructor for Mallee Lands (Mr. C. P. Hodge) attended and delivered an address, "Rotation of Crops."

**TALIA, March 13th.**—The forthcoming visit of the officers of the Department of Agriculture to Branches of the Bureau on Eyre Peninsula formed the chief subject for discussion. Other items brought forward were various stock complaints, the steamship service, and the extension of Mount Hope railway.

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### EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES).

**GERANIUM** (Average annual rainfall, 16in. to 17in.).

March 9th.—Present: nine members and visitors.

**RABBIT DESTRUCTION.**—Mr. H. O. Dohnt, who contributed a short paper on this subject, was of the opinion that the only effective method of dealing with the rabbit pest was by concerted efforts on the part of the farmers. The poison

cart was most useful if used on a day immediately following a fall of rain, but so soon as green feed was obtainable the rabbits would not touch the baits. *Ferrets and traps should be used when grass was in the paddocks, and all the holes and warrens destroyed.* Success had also been obtained by pumping heavier than air fumes into the burrows, but the rabbits on vacant lands and along the railway lines were a continual source of worry to the settlers. Mr. Mitchell spoke of the good results that had been obtained by using a machine which burnt cocky chaff and sulphur, the fumes from which were pumped into the holes.

#### LAMEROO (Average annual rainfall, 16.55in.).

February 18th.—Present: 13 members.

**HARVEST REPORTS.**—Mr. A. G. Burns reported Yandilla King 17½bush. and Carawa 21bush. per acre; also a good cut of hay from both Algerian and Ruakura oats. Mr. A. J. A. Koch.—Federation, 24bush.; Yandilla King, 18bush.; Late Gluyas, 16bush.; and Gluyas Early, 19bush. per acre; average for farm, 18bush. Mr. P. J. James.—Marshall's No. 3, 19bush.; Queen Fan, 20bush.; Yandilla King, 16bush. Some other varieties were thinned out badly with grubs, which brought his average down to 16bush. Mr. W. J. Morecom.—Late Gluyas, 22bush.; Caliph, 26bush.; Major, 18bush.; Yandilla King, 14bush. per acre; farm average, 18bush. Messrs. Davidson, Kriewaldt, and Crispe also gave satisfactory reports. Mr. G. H. Twelftree gave the best report, having an average of 20bush., and was of the opinion that Carawa was one of the best wheats for the district. The hay crop in most cases was good.

#### MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

February 11th.—Present: 17 members and visitors.

**POULTRY.**—The monthly meeting of the Branch was held at the residence of the Hon. Secretary (Mr. C. F. Altmann), when a paper dealing with the above subject was contributed by Mr. W. Braendler. The speaker was of the opinion that turkeys were the most profitable class of poultry to keep on the farm; they were easy to rear and brought very good prices in the market. The farmer who kept 100 hens of a good laying strain, and gave them proper care and attention, should be able to make a good profit from the birds. In order to avoid the breeding of chicks during the wrong seasons of the year, the speaker suggested that the cockerels should not be allowed to run with the hens during the first week in July and the last week in November. Referring to the heavy breeds, he expressed a preference for the Black Orpingtons. They were good egg producers, and made excellent table poultry. Separate hatching pens should be provided for each hen, and a nest of earth should be prepared before the eggs were placed under the bird. If the setting was carried out during warm weather, the eggs should be damped to prevent the chicks from dying in the shell. The young chicks should not be fed during the first 24 hours after hatching out, but after that they could be given a wet mash three times a day. It was most important to provide a liberal supply of shellgrit, fresh water, and green feed every day, and the drinking vessels should be cleaned out every day, and supplied with fresh water. The poultry yards should be erected at some distance from the implement and machinery sheds. For the farmer just commencing to keep poultry, the speaker suggested the purchase of birds or a setting of eggs from a reliable poultry keeper. In the discussion that followed, members did not think that turkeys were as profitable as set out in the paper. It was also agreed that the White Leghorn was the best egg-producing bird, but that they could not be recommended for table poultry, a preference being expressed for the Black Orpingtons.

#### MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

March 11th.—Present: 12 members and two visitors.

**FENCING.**—In the course of a paper under the above title, Mr. H. Rayson said ordinary posts for fencing should be 5ft. 4in. long and not less than 4in. at the smaller end, and for strainers he favored posts 6ft. 3in. long and 9in. at the



smaller end. Posts should be spaced 15ft. apart, and be placed 20in. in the ground, with a strainer every 10 or 12 chains, 2ft. 6in. in the ground. For the spacing of the wires he suggested the following distances:—First, 7in. above the ground; second, 13in.; third, 19in.; fourth, 26in.; fifth, 34in.; sixth, 44in., with a barb of 12 x 3 gauge on the top. The fence to consist of No. 8 black or galvanized wire. For convenience in handling the barb wire, the speaker said a crowbar should be placed through the reel and attached to the back of the wagon or dray, and as the horse was moved forward the wire would unroll. If a  $\frac{1}{8}$ in. bit was used for boring, it would be found that the wire would pull through the posts without any difficulty. For a straight line of fence the strut should be placed against the post in the direction from which the wires were tightened, and for the corners two struts should be used to keep the fence in position. The struts should not be let into the posts higher than 2ft. from the surface of the ground. The bottom wire of the fence should always be strained first. In the discussion that followed, some members expressed the opinion that posts from 20ft. to 25ft. apart with one dropper between would make a very serviceable fence. One member stated that he had put the wooden posts 30ft. apart, with one iron dropper between, and the stock had given no trouble whatsoever.

#### YOUNGHUSBAND.

February 9th.

CO-OPERATION.—A paper on the subject of "Co-operation" was contributed by Mr. G. H. Mann. The speaker thought there was room for considerable extension of the principles of co-operation, and was of the opinion that if the farmers were to combine and purchase their requirements in larger quantities, they would effect a considerable monetary saving. He believed the same methods could also be adopted to the breeding of stock. Very often it was not possible for one farmer to purchase a high-class sire, but by co-operating a number of farmers would be able to secure a first-class animal, and thereby improve the standard of their herds and flocks. Machines such as a grader, poison cart, header, maize sheller, and currant stemmer, &c., could also be secured on the co-operative principle.

At a further meeting, held on March 9th, the Chairman read a paper from the *Journal of Agriculture*, "Rabbit Destruction," and an interesting discussion ensued.

BERRI, February 18th.—The judges' report on the Peter Wood Cup competition was presented. Last year was the first season the trophy had been competed for. Mr. W. M. Gillard was the winner, gaining 93 points, and Messrs. Halliday & Sons second with 91 points. It is necessary for the trophy to be won three times before becoming the property of a competitor.

BERRI, March 14th.—The Horticultural Instructor (Mr. Geo. Quinn) visited the Branch and delivered an address, "Root-gall on Fruit Trees."

BRINKLEY, February 11th.—HARVEST REPORTS.—Mr. Wilhelm reported that his hay crop averaged  $1\frac{1}{2}$  tons per acre, oats 5 bags, and wheat 8bush. per acre. Messrs. Pearson Brothers reported that the hay crop averaged 2 tons; wheat:—Marshall's 15bush., Budd's 4bush., Federation 10bush., average 12bush.; barley, 12bush.; and oats, 12bush. Messrs. Richard Brothers' crop averaged  $1\frac{1}{2}$  tons to the acre for hay; oats, 6 bags; wheat on stubble, Budd's 4bush., Gluyas 7bush., Federation 5bush.; wheat on fallow, Major 24bush., Gluyas 25bush., Budd's 12bush., and Federation 12bush. per acre. Several other members also spoke.

COONALPYN, February 10th.—An interesting discussion took place on the merits of the harvester and the stripper. Mr. Cronin, who during the past season had used a harvester for the first time, stated that he would always use that machine in preference to the stripper, excepting in those places where high mallee shoots were in the crop. Mr. Wall also spoke in favor of the harvester. Messrs. Pitman and Tregenza thought that during the first few years on the mallee block a stripper should be used.

LONE GUM, February 8th.—Mr. W. L. Muspratt (Irrigation Instructor) attended the meeting and delivered an address, "The Dipping and Drying of Vine Fruits," to an audience of 48 members. At the conclusion of the address Mr. Muspratt replied to numerous questions.

LOXTON.—At a recent meeting of the above Branch the harvest reports of the past season were discussed. Mr. R. E. Thiele was of the opinion that early varieties of wheat—Gluyas, Golden Drop, and Improved Federation—were most suitable for the Loxton district. Mr. J. Schulz, jun., favored Early Gluyas, Golden Drop, and Carmichael's Eclipse for grain, and Silver Baart for hay. Mr. R. Thiele stated that oats should be sown after the land had carried three crops of wheat to improve the soil and provide feed for the next year.

NETHEFTON, February 10th.—The meeting was devoted to a discussion on the 1921-22 harvest returns. It was generally agreed that the hot spell of weather during November was responsible for the light returns from some of the most promising crops. Some of the crops were also somewhat affected with take-all, rust, and smut.

PINNAROO, March 9th.—An address, illustrated with lantern views, "The Economic Value of Our Native Birds," was delivered by Capt. S. A. White, C.M.B.O.U. (member of the Advisory Board of Agriculture), to an audience of 14 members and 160 visitors.

RAMCO, February 6th.—Matters in connection with the forthcoming annual pruning competitions for Branches of the Agricultural Bureau along the River Murray were brought before the meeting. Other matters of local interest were also discussed.

TAPLAN, February 25th.—The Hon. Secretary (Mr. P. R. Hodge) read an article, "For and Against Close Breeding."

WILKAWATT, March 11th.—Mr. J. Lillecrapp was responsible for the subject of the evening, which took the form of a paper, "Farm Horses." An interesting discussion followed.

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## SOUTH AND HILLS DISTRICT.

HARTLEY (Average annual rainfall, 15in. to 16in.).

February 8th.—Present: 11 members.

HOW TO MAKE COUNTRY LIFE MORE ATTRACTIVE.—Mr. H. S. Stanton, who contributed a paper on this subject, said one should aim to provide as many conveniences as possible to lighten the work on the farm. The matter of expense was a vital factor in building homes, and one had to limit activities to the means available; but such things as having the water laid on from the tank to the washhouse, bathroom, and kitchen should be within the means of all. Ornamental and useful timber trees should be planted to improve the appearance and value of the holding. The chaffhouse should be situated at the end of the stable, with a door leading from the stable to the chaffhouse. He preferred a stable constructed of stone, with scrub broom on the sides. Such a building would be cooler during the summer than one constructed wholly of iron. The barn should also be built of stone with an iron roof and a floor of timber or concrete. The floor should be built high enough to enable a trolly or dray to go alongside and load or unload without inconvenience. A good implement shed was essential, and each implement, after being finished with in the paddock, should be thoroughly overhauled and repaired before being put away. Substantial fences were an asset on a farm, and all repairs thereto should be carried out so soon as the defects were noticed. It should be borne in mind, he said, that a rural occupation often entailed hard work and long hours at certain times of the year, and the aim of the employer should be to shorten the hours when practicable. The reason that so many of the younger generation left the country for the towns was the shorter hours of labor, the Saturday afternoon holiday, and the Sunday free from work. A good discussion followed the reading of the paper.

Mr. F. Lehmann then contributed a paper entitled "Conservation of Lime on the Farm," which caused a good discussion.

The harvest results for the season were then discussed. Members favored Smut-proof as the most suitable wheat for the district, and yields ranging from 9bush. to 20bush. per acre were reported. Federation, Carawa, Gluyas, Queen Fan, and Marshall's averaged from 9bush. to 12bush. Calcutta and Cape oats yielded from 15bush. to 30bush. and Scotch Grey up to 30bush. Algerian oats averaged 12bush.

IRONBANK (Average annual rainfall, 33.34in.).

February 10th.

FRUIT *versus* VEGETABLE GROWING.—The monthly meeting of the Branch was held at Mr. C. Morgan's residence, when a discussion took place on the above subject. Mr. Slater contended that it would be a more payable proposition to grow vegetables for market than to plant fruit trees. So many acres of late years had been planted with trees that he considered the supply would soon be greater than the demand, and fruit would be almost unsaleable. With vegetables, however, the situation was different. So many small suburban holdings were being cut up into residential sites that vegetable growing was gradually being confined to the hills, so that, provided the grower had a permanent water supply, he would be much better off in the long run than the fruitgrower. Mr. Morgan was of the opinion that fruitgrowing could never be overdone. He pointed out that the argument used by Mr. Slater was put forward years ago, but the present time showed no justification for it. Provided the grower aimed at producing an article of the finest quality, he was sure that it would always find a ready market, either for local or export trade. Mr. Tucker brought under the notice of members the success of an experimental plot of Sudan grass grown by him. His attention was first drawn to the grass through the *Journal of Agriculture*. A quarter of an acre of dry hill land was sown at the end of November, the seed being mixed with manure and broadcasted; quantities, 6lbs. seed, 56lbs. bone super, and 14lbs. sulphate of ammonia. The first cutting averaged 3ft. high, and the second 3ft. 6in., and the grass was looking well for a third cut. Mr. Tucker mentioned that he had no water for irrigation purposes.

MILANG. (Average annual rainfall, 15.42in.).

February 11th.—Present: 19 members.

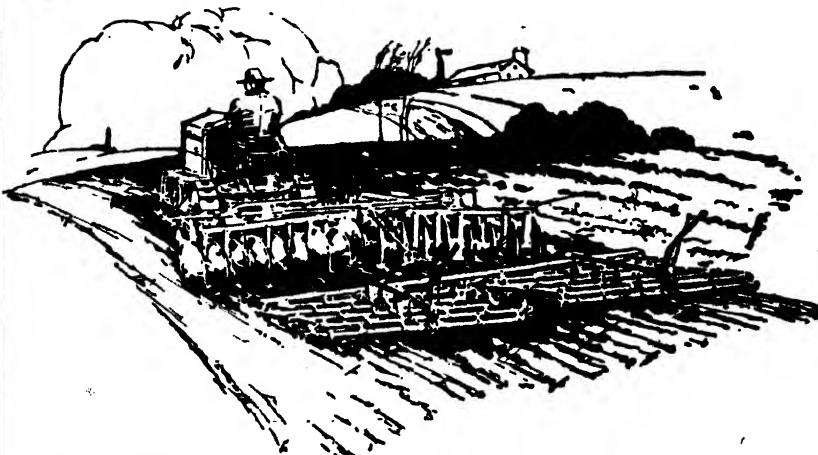
**SOME ADVANTAGES OF BEING A MEMBER OF THE AGRICULTURAL BUREAU.**—In the course of a paper dealing with this subject, Mr. L. H. Moar said numerous social and business advantages were conferred upon members of the Agricultural Bureau, but a Branch to be successful should have energetic officers at its head. Much was to be said in favor of homestead meetings, for many agricultural subjects could be explained and proved in concrete manner on the spot, and the practical demonstrations of machinery and the inspection of stock and crops made a better impression on the individual than a lengthy discourse on the subject. Members of the Bureau should set an example of good farming for the whole of a district, and the problems that had to be faced by the producer were so many that there was almost unlimited scope for experimental work. An interesting discussion followed.



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**MOUNT BARKER** (Average annual rainfall, 30.93in.).

March 15th.—Present: 37 members and three visitors.

**SUBTERRANEAN CLOVER.**—The following paper was contributed by Mr. A. Howard:—"This plant derives its name by its peculiar manner of developing its seed pods beneath the surface of the soil. Although it is an annual, it can be regarded as perennial, for when once it is established in a field, that field does not require a further sowing. As soon as the flower fades, the undeveloped seed pod gradually turns towards the ground, and those nearest the soil eventually bury themselves, and with the first autumn rains the seed quickly germinates, and within a month the field, which before appeared barren, is transformed by the quickly-growing plants, upon which stock begin to feed. Through the winter and spring, and right on into the early summer, there is an abundance of succulent nitrogenous herbage, on which all stock quickly fatten. Horses and sheep will fatten on the seed in the pods when there is nothing else left in the field. This can be said of few other fodder plants. From the middle of December until the following April the paddocks are apparently bare, and yet stock will remain fat when grazing therein. The stems are of a creeping habit, and the individual plant under some conditions will grow 4ft. or 5ft. across, and one such plant will produce as many as 1,500 seeds, or even more. In a field the stems interlace, forming a mass of herbage 6in. or 7in. deep, the foliage above the stems growing to a height of several inches. Its mode of reproduction makes it the most economical fodder plant known, for once it is sown and established it needs no other cultivation. One sowing will suffice for a lifetime. No other annual, or even perennial, can approach it in this respect. It never becomes a pest, for it is easily destroyed by ploughing. The seed pods, too, are not troublesome in wool, as some trefoil seed pods are. This clover is very hardy; cold does not affect it, and it will grow on any soil except swamp lands, but particularly is it valuable for poor, gravelly land, where other grasses perish, thus enhancing the value of the land by producing good pasture for sheep and cattle, and increasing the carrying capacity of the land three and four fold. It will respond, too, to more favorable conditions. If sown on land that has been manured for previous crops it will do exceptionally well, at the same time improving the soil by introducing nitrogen—one of its strong and valuable characteristics. When cut green, and with favorable weather, it makes excellent hay, which is readily eaten by both horses and cows. When sowing the seed very little preparation is required. Scattered on the surface it will grow and take root readily, although a light harrowing and rolling is beneficial. To ensure a good crop on poor land all that is required is about 1wt. of bone super to the acre. This application should be repeated every three or four years. It is noticed that even bracken fern has had to give way to subterranean clover. If this plant is capable of knocking out the bracken and other comparatively useless grasses that grow on the more or less barren hillsides, it will be a most valuable forage plant. In fact, any country of suitable climatic conditions where the rainfall is not less than 20in. per annum, will yield excellent results. The seed should be sown from the end of March until August. As the initial cost of sowing is the only one, from 6lbs. to 8lbs. of seed per acre will give splendid results, but a smaller quantity, say, 2lbs. per acre, is enough to start it, and for the following season a good crop is ensured."

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**ROCKWOOD.**

February 13th.—Present: 13 members.

**FARM BOOKKEEPING.**—Mr. E. R. Heath, who contributed a paper on this subject, advised all those engaged in agricultural pursuits to adopt a system of book-keeping. The farmer who kept an account of his transactions was able through his books to tell at a glance what revenue his farm was yielding, and, in addition to that, the compilation of the income tax returns was greatly facilitated. In the first place, every farmer should have a current account with the nearest bank, into which all cash received, with the exception of very small amounts, should be paid, and cheques drawn for all moneys paid away in the settlement of bills. A year ending with June 30th, he thought, would be most convenient, as it would then correspond with the closing of the Government financial year. A small book, ruled with a column for the date, one for details of transaction, and a third for a cash column, was very suitable as a first entry book. Entries in that book should

be made at the time of transaction, to prevent small items from being forgotten, and all dealings in connection with the farm should be included therein. By keeping a cash book, in which were entered only transactions made through the bank, a petty cash book, for dealings that were not made through the bank, and a day book for all transactions made on credit, the profit and loss of the farm for 12 months could easily be obtained. If a farmer had business agencies, he advised the opening of a ledger, wherein a record could be made of the small items, and later these could be entered in the right books in combined form. At the end of each month the books should be balanced, and the debit or credit balance, as the case may be, carried on for the next month, excepting in the case of the day book, where, if any of the items had been settled, they could be passed into the cash or petty cash book. Those amounts still standing at credit could then be made over to the next month, with any necessary additions. Instead of drawing numerous cheques for trivial dealings, the petty cash book should be reimbursed periodically by the drawing of a cheque for the amount expended. At the end of 12 months, *i.e.*, June 30th of the following year, an inventory of the farm, wherein should be carefully noted the natural increase in livestock, new season's wheat, or other produce on hand, such as hay, &c., should be made, and that, in conjunction with the profit and loss account, would readily show the net profit for the farm. Any fixed deposit interest should be added on later, as it did not pertain to the farm, and thus the net profit for the year would be obtained. Depreciation in value of the farm stock, plant, &c., should not be omitted in making up the account, but all purchases made out of capital, *i.e.*, those that were an asset to the farm, should be included. When the net profit for the farm was obtained, a balance-sheet for the year could be compiled. Different files should be kept for account sales, receipts, &c., to facilitate reference when necessary. If a system of farm bookkeeping was carried out by farmers, there would not be that continual difficulty in finding the annual income and filling in the State and Federal income tax returns.

**ASHBOURNE**, February 13th.—The meeting took the form of a debate, the subject being "Which is the most profitable cow to keep, Jersey or Shorthorn?" Messrs. H. Cuming, G. Haines, E. Haines, G. Whittham, C. Pitt, and C. Moore supported the Jersey, and Messrs. G. Sissens, D. Whittham, K. Kirkham, L. Cuming, W. Newton, and F. Allingame spoke in favor of the Shorthorn. The debaters advocating the merits of the Shorthorn were judged the winners by three points. A good discussion followed.

**BLACKHEATH**, March 10th.—The Hon. Secretary (Mr. R. S. Talbot) read an article, "Fruit Drying," and a good discussion followed. Other items of local interest were also brought before the meeting.

**CHERRY GARDENS**, March 7th.—The Assistant Dairy Expert (Mr. H. J. Apps) attended the meeting, and delivered an address, "The Best Breed of Dairy Cow for the Hills Districts."

**CLARENDON**, February 6th.—Mr. H. C. Harper gave an interesting account of a recent trip he had taken to the Blue Mountains, New South Wales.

**IRONBANK**, March 9th.—The monthly meeting of the Branch was held at Mr. W. Slater's homestead. The meeting took the form of a question box, when several interesting subjects were brought before the meeting and discussed.

**MEADOWS**, February 8th.—Final arrangements were made for the staging of the Bureau exhibit at the local show. Mr. Hirschfield tabled a specimen of Scottish Triumph potato, which was planted during December, 1921. The tubers showed good, clean, and healthy growth.

**MEADOWS**, March 15th.—A lengthy discussion took place on the exhibit of produce that had been staged by the Branch at the recent local show. Reference was made to the fine work performed by Messrs. F. Wright, sen., and W. Nicolle in displaying the exhibit, which was awarded first honors.

**MORPHETT VALE**, March 16th.—Several subjects, including rotation of crops, harvesting machinery, varieties of wheats and fertilisers, were brought before the meeting, and an interesting discussion ensued.

**MOUNT BARKER**, February 8th.—Mr. C. H. Beaumont (Orchard Instructor and Inspector) attended the meeting and delivered an address, "How to Start an Orchard" to a gathering of 44 members and four visitors.

**NARBUNG**, February 14th.—Several subjects, including the provision of veterinary surgeons for country districts and the boy immigration scheme were brought forward, and an interesting discussion followed. At a further meeting, held on March 18th, the Hon. Secretary (Mr. W. T. Lawrie) brought under the notice of the members the efforts being made to introduce cotton-growing into South Australia. Articles on the subject from a Queensland publication were read, and it was decided to make application for cotton seed, in order that local experiments might be undertaken.

**PORT ELLIOT**, February 11th.—An interesting discussion took place on the subject, "Depth of Ploughing." The Chairman (Mr. H. Welch) recommended shallow ploughing for light soils. It was stated that by ploughing "in lands" the soil would be provided with a good drainage, but at the same time the furrows would be rough on the harvesting machinery.

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## SOUTH-EAST DISTRICT.

FRANCES (Average annual rainfall, 20.10in.).

January 28th.—Present: seven members.

**FARM FENCING.**—"A considerable number of farmers consider a good fence to be a waste of capital and energy, whereas, in my opinion, I do not see how the farm can be properly worked without good fencing," said Mr. Krahner in a paper on the above subject. He thought that the time lost in taking the stock out of the crop and neighboring paddocks would soon pay for a well-constructed fence. Regarding the method and means of erecting, he said boundary fences should be of six wires, as follows:—First wire 7in. from ground, then 6in., 6in., 6½in., 8½in., and 9½in., giving a fence 3ft. 7½in. to the top wire. Where timber was plentiful, he recommended the erection of good-sized split posts, with strainers, at least 2ft. 6in. in the ground, and 12in. circumference at the top, at intervals of five chains. Ordinary posts should be at least 5ft. 4in. in length, and the strainers 6ft. 6in. The corner posts could be placed 3ft. in the ground, well stayed with split struts 10ft. or 12ft. long, and a cross piece let into the ground at the heel of the post. Four inches should be allowed above the top wire to prevent the post from splitting while straining the wires. In the event of barb wire being preferred for the top, the posts should be 2in. shorter, to give the same height of fence. A fence of five wires, 3ft. 6in. in height, with wires placed as follows:—First, 7in. from ground, then 8in., 8in., 8in., and 1in. from the top for the barb, did not meet with ordinary requirements, as the wires were not placed sufficiently close to hold lambs, and the top wires were just a convenient distance apart to allow the stock to place their heads through, and push the fence over. Posts 18ft. apart, with a good, stout dropper in the centre, made a strong fence, and he considered that the best method of fixing was that of boring the posts and pulling the wires through, and tying them to the top and bottom wires. When vermin-proof fencing was required, only the best quality netting should be used, 42in. x 17 gauge x 1½in. mesh. The posts should be erected to a height of 3ft. 10in., and be placed 22in. in the ground. Strainers could be used as set out for the other fence, with a plain wire 18in. from the ground level. The second wire, to which the netting was tied or fastened, should be 3ft. from the ground, and the third wire 8in. above the netting, which should be 6in. in the ground.

At a further meeting, held on February 25th, consideration was given to several matters having relation to the forthcoming Conference of South-Eastern Branches, to be held at Mount Gambier.

## KONGORONG.

February 9th.—Present: nine members.

**CULTIVATION.**—Mr. C. T. Atkin, who read a paper on this subject, said one of the main points in the production of good crops was to have the land free from all foreign plants and weeds. That could only be obtained by thorough and systematic cultivation. For their district he thought it best to plough the land that was too hard for summer fallowing during the spring preceding the winter in which it was intended to sow the crop, so that the sorrel and other weeds could be destroyed during the summer. For the lighter classes of soil he was of the opinion that it was best to plough the land, and not to work it again until a good fall of rain was received. The heavy land would, of course, need working during the summer with a spring-tooth cultivator. He was strongly convinced that the farmers in that district would obtain better returns if they only put in half their usual acreage, and devoted more work to the cultivation of the land. Not only would there be a larger area under grasses, but a considerable saving would be effected in seed and labor and at harvest time. He favored ploughing at a depth of 3in., early sowing, good seed, and plenty of super. In the discussion that followed, Mr. Morrison thought summer ploughing should be carried out up to 6in., but not if the crop was to be sown immediately after fallowing. Mr. F. Perkins favored the 3in. ploughing.



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## KONGORONG.

March 9th.—Present: 17 members and four visitors.

**ECONOMY ON THE FARM.**—The Chairman (Mr. F. W. Perkins) read a paper on this subject, in the course of which he first referred to the homestead buildings, which he considered should not be too large, because the women folk on the majority of farms had many odd jobs to do in addition to their household duties. Stables were a necessity on the properly-managed farm to shelter the horses from the bleak winds and rough weather during winter. The high price of machinery should be sufficient argument for the farmer to see that after the implements had been used in the fields they should be housed under cover until required next season. The feeding of the stock played a most important part in the economic management of the farm. The fodder that had been conserved for the stock during the autumn and winter months should not be wasted, but at the same time the animals should be given sufficient feed to keep them in good condition. He considered it a mistake to sell the fodder when it was at a high price, and then not have sufficient on hand to properly provide for one's own stock. Stocking the farm above a reasonable carrying capacity was also a mistake. Fences should be erected with the best materials, for not only would they add to the value of the farm if it was offered for sale, but good, substantial fences would last for a very long time, while if the work was done in a slipshod manner the fence would have to be reconstructed in a very little while. The speaker then drew attention to the carelessness that was displayed by some farmers when articles produced on the farm could only be sold for a small price. He referred more particularly to sheepskins. When the market for the pelts was at a low figure it was a common sight to see the skins lying on the fences, and no care whatever taken of them. If the household was sufficiently large, mutton raised on the holding should be used for the meat supply, but during the summer time, when it was difficult to keep the meat, it was sometimes advisable to procure the meat from the butcher. Oil and paint could be purchased for less money than either wood or machinery, and it was a good plan to see that the machines and implements were properly oiled and all woodwork painted. Surplus cows and horses should be disposed of, rather than deprive useful stock of the feed given to the animals that were not working. Members discussed the paper, and agreed with the views contained therein, special prominence being given to care of machinery and vehicles, thatching of haystacks, destruction of rabbits, and care of skins and hides.

## MOORAK.

February 9th.

**CARE OF HARNESS.**—The monthly meeting of the Branch was held at Mr. T. Barry's residence, when a paper on the above subject was contributed by Mr. J. Boardman. The speaker said the expenditure involved in the purchase of good harness should in itself be sufficient cause for the farmer to give it every care and attention. It should be well oiled or greased, and if the leather was dirty, it should be scrubbed and washed with soft soap and hot water. After being hung up to dry, a dressing of neatsfoot oil should be applied. Fat black was good on light harness, but was rather expensive. A set of harness well cared for should last 20 years. When any part required repairing, it should be mended at once. A good plan was to have a supply of copper rivets, needles and thread, and leather on hand, so that most of the repairing could be done on the farm. The collar was a most important piece of harness, and they should be kept well stuffed and lined. If a horse developed a sore shoulder, and it was necessary to work him, a little gall cure should be applied and a hollow made in the collar directly over the sore.

**ARTIFICIAL MANURE.**—Under the title "Does it Pay to Use Artificial Manure in this District?" the following paper was read by Mr. T. Barry:—"From my experience for the last five years I am quite satisfied that it does pay. I have used it on chou-moellier, maize, oats, and barley, and it has been a success every time. Last year I had three plots of chou-moellier of one acre each, side by side. No. 1, no manure; No. 2, 1ewt. bonedust; No. 3, 1ewt. super. The super came out well on top. Beside plot No. 3 I had two acres of maize with 1ewt. of super to the acre, with the exception of one width of the drill through the centre of the

crop with no manure. All through the year it looked from a distance as if there was a track through the centre, and the plants on each side were fully 2ft. higher. This year I sowed Cape barley on all these plots, and you could see to the furrow where the super was sown. Do not sow less than 60lb. or 70lb. to the acre."

#### MOORAK.

March 21st. Present: 11 members.

**THRESHER VERSUS HARVESTER.**—The monthly meeting of the Branch was held at Mr. McIntosh's residence, when a paper on the above subject was read by Mr. Buck. The speaker strongly advocated the thresher in preference to the harvester for gathering the crops in the Moorak district. By cutting the crops with the binder, and threshing the sheaves in one place, the spread of weeds all over the fields was prevented. Again, when the thresher was used, one was able to conserve the straw, which provided shelter for the stock during the cold weather, and was an excellent stand-by during bad seasons. The President (Mr. T. Barry) expressed a preference for the harvester, because with that implement it was possible to catch an early market with the grain. He suggested cutting more hay, instead of feeding the straw to the stock. Mr. Nicholls was of the opinion that threshing was too expensive to be carried out on small holdings. The Hon. Secretary (Mr. H. S. Tarrant) supported the paper. He considered that many farmers had been fully compensated for the extra expense of threshing by having either the straw for sale or for shelter for the stock and as a stand-by for bad seasons. Messrs. W. Palamountain, K. McIntosh, and E. S. Alcock also supported the paper.

#### MOUNT GAMBIER (Average annual rainfall, 32in.).

February 11th.—Present: 12 members.

**CONTAGIOUS ABORTION IN CATTLE.**—Mr. J. Keegan contributed the following paper on this subject:—"Abortion in cattle is a very troublesome and difficult complaint to treat, and causes considerable loss to the farmer who finds that his cows continue to come into season without calving. The transmission of the disease may be effected naturally in one of three ways, viz., (a) through the agency of the bull during coition, the sire transferring the discharge from the affected to the susceptible cow; (b) through the external genital passage. In this case the external genital—the vulva and the tail—are soiled with the discharges from the fœtus or fetal membranes from a neighboring cow that has aborted, or by contaminated litter. The bacilli advance into the uterus through the vagina. The disease has been artificially produced by introducing infected material and cultures of the organism into the vagina; (c) by means of the consumption of contaminated food or water. This is probably a very frequent cause of infection. The grass, pasture, or foodstuffs may be infected by the vaginal discharges, the aborted fœtus, or fetal membranes. Infected material may be transported long distances in soiled manure on the coats of aborting animals and their companions, or on the hands and boots of attendants. The disease has been artificially produced by causing animals to swallow contaminated material and cultures of the bacillus. Pregnant cows are naturally susceptible to the disease. Outbreaks of contagious abortion in cows are not generally associated with outbreaks among mares and ewes. Nevertheless it is necessary to remember the susceptibility of mares and ewes to the contagious abortion of cows when dealing with outbreaks of the latter disease. A certain degree of immunity from the disease is acquired after the first attack. Experience shows that if a cow is infected on a second occasion she will carry her calf for a longer period than in the first instance, so that within three or four years, in spite of exposure to infection, the cow will ultimately carry the fœtus to its full time. The period of incubation in this disease is taken as the period which elapses between infection and abortion. Experimentally it varies between 33 and 230 days, the average being 126 days. A cow's normal time varies from 280 to 285 days, the longest on record being 358 days. The symptoms are those of abortion. This accident rarely occurs before the third or

fourth month of gestation, more frequently during the fifth, sixth, or seventh month, or even later. There is only a slight uneasiness for a few hours previously, with a sinking of the flanks and a lowering of the abdomen. The affected animal generally looks well, and yields its usual supply of milk. Quantities of mucous membrane (frequently blood stained), and later on a yellow discharge, comes from the vulva, and soils the tail of the cow. Soon afterwards the fœtus is expelled with little effort or inconvenience, and along with it the membranes—if these are not ruptured. It is rarely that the ruptured membranes are rejected immediately after the fœtus. Usually they are retained, particularly when pregnancy is advanced. When attempts are made to get rid of them by hand this is found difficult, owing to the membranes adhering to the cotyledons, and they thus come away in fragments. The animal generally loses its appetite and condition, and goes off its milk. The fœtus is usually dead, though when it is expelled after the fifth month it may be alive, but is weakly, and soon dies. Even when born near the termination of pregnancy these calves make a rattling noise when breathing, and discharge a rusty-colored mucilaginous fluid from the nostrils. They are attacked by diarrhœa, bellow continually, and are emaciated and flabby. Cows showing signs of abortion, or which have aborted, should be isolated from their fellows. The aborted fœtus (even if alive) and the fœtal membranes and discharges should be removed and destroyed. The fœtal membranes, if retained, must be removed as early as possible and destroyed. Afterwards the vagina and uterus should be injected once or twice daily with an antiseptic, such as a 2 per cent. solution of carbolic or a one in 5,000 solution of corrosive sublimate (bichloride of mercury). The vulva, tail, and thighs must also be sponged down with a disinfectant and kept clean. Some of the cows giving trouble may be suffering from occlusion of the os uteri, or opening from the vagina to the uterus. If this trouble exists it would require much time and trouble to overcome it, and no animal could become pregnant while in this state. The dairyman will have his hands full if abortion appears among his herd. It is no use him selling the bull, which only passes the trouble on. The animal should be treated, and I will admit that anyone with, say, 20 cows, will be kept going to treat them; but this he must do to get rid of the trouble." During the discussion which followed, Mr. Pritchard said abortion was a disease which caused more loss to dairymen than any other. It was so serious to the welfare of the rest of the herd that he would sooner one of his cows died than aborted. He advised dairymen, on the first sign of any discolored discharge, to treat their animals at once. He had found the injecting of disinfectant—carbolic, Condy's crystals, or washing soda—effective.

#### NARACOOORTE (Average annual rainfall, 22.60in.).

February 11th.—Present: 10 members.

**MIXED FARMING.**—Mr. C. Bray, who contributed a short paper on this subject, said the districts in and around Naracoorte were devoted almost solely to the practices of mixed farming, and he believed it advantageous for the farmer to rear his own stock. Horses were indispensable on every holding, and the farmer should endeavor to breed his team from good, staunch mares. The cows should be mated with a good bull, and if that plan was followed out the standard of the herd would be considerably raised. Sheep should play a prominent part on every farm, and in order that a good flock might be built up he suggested the purchase of a few good breeding ewes. If these were mated to a proved sire, and a rigid system of culling carried out, the farmer would have no difficulty in breeding first-class animals. Overstocking was a mistake, and it was false prosperity to attempt to keep more stock than the land was capable of carrying. He thought it advisable to grow several varieties of wheat during the one season, because the weather conditions frequently proved disastrous to one variety, whilst good returns would be obtained from another. Referring to oats, the speaker said he had not found any variety that gave better average returns than the Algerian. An interesting discussion followed, in which Messrs. C. Drake, E. S. Alcock, W. E. Rogers, and A. B. Feuerheerd took part.

**PENOLA** (Average annual rainfall, 26.788in.).

March 4th.—Present: 10 members.

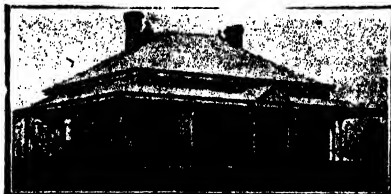
**WORKING AND HARNESSING HORSES.**—In the course of a paper dealing with this subject, Mr. Hinze said when catching the horse in the stable yard the animal should be made to first face its master, and if in the stall he should be made to stand "sideways on." Some horses had a habit of holding their heads up very high when an attempt was made to put on the blinkers, but if the blinkers were just slipped on over the head the bit could be placed in the horse's mouth without any very great difficulty. The team should be groomed in the morning, and during the dinner hour a practice should be made of examining their shoulders for lumps or sores. If the team consisted of five or less horses, he favored working abreast, but for six or more horses best results would be obtained from the tandem system. With the latter method one was able to work a weak animal behind a good horse, and if a colt was being broken in, he could be placed at the back on the near side, where he would be able to do but very little damage if he became

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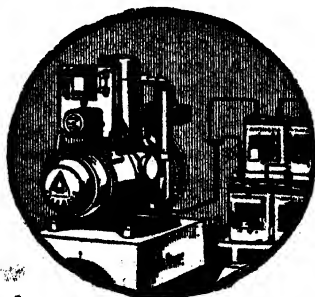
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fractious. He favored the one yoke method of working the team, as it was not so hard on the horses, with the exception of harvest time. The speaker did not have any faith in the application of ointments for sore shoulders, for he considered that the grease, &c., caught the dust and dirt, and only added to the irritation. His plan was to bathe the horse's shoulders with cold water every time that the collar was removed. In the discussion that followed, Mr. F. Kidman was not in favor of putting on the bridle without first inserting the bit in the animal's mouth. It could be usually taken as a sign that the horse that was constantly throwing up its head had been subjected to very severe handling at one time or another. Mr. Adamson's experience with regard to wooden collars was that they were suitable for light work, but not for wagon work, as there was no elasticity in them, and they were likely to jar the animal. Mr. Hinze, in reply to a question, stated that mutton fat mixed with neatsfoot oil was good for harness. Mr. G. Yeates recommended the following recipe for a light harness dressing:—"To 1 pt. bottle cod oil add 2lbs. mutton fat (no salt), 4ozs. of beeswax, 2 tablespoonsful of fat black. The ingredients to be boiled together and rubbed into the harness." Mr. Yeates tabled an excellent sample of apples, "Maiden's Blush," which he stated were a splendid drying variety, but they could not be recommended for their keeping qualities.

#### RENDELSHAM.

February 8th.—Present: 17 members.

FARM SANITATION.—"Why is it," said Mr. V. C. Slee, in a paper on the subject, "Farm Sanitation," "that the things that are looked upon as necessities in the city are considered luxuries in the country?" The writer held the opinion that if it was necessary to take all precautions against disease in the city, it was equally important to do so in the country. If the people could be educated to remove all germ-carrying material, the risk of contracting disease would be reduced to a minimum. It was quite true that the sanitary conveniences of the city, such as the deep drainage and the disposal of household refuse, were not possible in the rural districts; but in their places the septic tank and the private incinerator would prove equally as useful. Good ventilation, light, and proper housing accommodation, were most essential to the good health of the people. A farmstead was not naturally a harbor for infectious diseases, but mosquitoes and flies were at times very troublesome. The latter, by their habits of scavenging in the filthiest places, polluted the food used for human consumption if proper precautions were not taken to guard against them. Wire doors and window screens were necessary as a means of defence, but the war should be carried to the enemies' quarters, and all material likely to provide breeding grounds and harboring places for the insects should be destroyed. To minimise the trouble from mosquitoes, all stagnant water should either be drained away or covered with a film of oil to prevent the young mosquito from reaching maturity. "Cleanliness is next to godliness," and sanitary conditions make clean-minded and useful citizens. Reference was also made to other sanitary innovations on the farm such as bathrooms, dairies, cowyards, and pigsties.

#### SECOND VALLEY.

March 4th.—Present: nine members.

THE PIG ON A MIXED FARM.—Mr. M. C. W. Ness, who contributed a paper on this subject, expressed the opinion that sufficient prominence was not given to the pigraising industry on the majority of farms. It was frequently argued that the reason for that statement was the uncertainty of the markets, but he was convinced that if a regular supply, over and above that required for local consumption, was produced, there would be no difficulty in opening up an export market for pig products. As a general principle the speaker was in favor of the practice of breeding the pigs on the farm. He had had considerable experience with most of the breeds of pigs, and had come to the conclusion that the Berkshire or a cross

of that breed with the Mid-York were the best classes of pigs for the farmer; but the most important point was to secure animals true to type. The sow should be one capable of mothering from nine to ten pigs each litter. For the market he preferred a pig of the baconer type that would weigh about 120lbs. in five or six months. Feeding.—Peas were a very fattening and easy crop to grow, and they could be fed to the animals with less labor and danger of injury than any other crop. He had obtained a net return from peas fed to pigs, without harvesting, of over £10 per acre. Feeding Methods.—Dry sows should be allowed to pasture on grass, lucerne, or any other green feed. When within three weeks of farrowing the sow should be enclosed in a sty and given a liberal supply of slop food, care being taken not to allow her to become too fat. When about to farrow, it was a good plan to give half a bottle of castor oil in the feed. The feed for the first 24 hours after farrowing should be given sparingly, but it could be gradually increased as the sow started to recover. Whilst suckling the pigs he suggested a ration of skim milk, pollard, and crushed oats. When the small pigs commenced to feed themselves, the door of the sty should be raised to enable them to have the use of another sty or yard where they could be fed separately on milk and dry grain, preferably English barley. In that way the young pigs could be gradually weaned. The sow could be removed and the pigs allowed to remain in the sty. If that was done there should be no ill effects from weaning. Regularity of feeding hours was important, and the pigs should be given as much food as they would eat. The speaker again emphasized the value of the pea crop, especially when the pigs were allowed to harvest it; but he considered it advisable to house and feed the pigs for about a fortnight prior to sending them to market. If the weather happened to be hot when the pigs were to be marketed, care should be taken not to feed the pigs before handling them. A drink of clean water on the day of marketing would be quite sufficient. The sties should be so erected as to receive the full benefit of the morning sun, while the enclosure in which the sow was placed to farrow should have a wooden floor. The speaker was of the opinion that brick and cement floors had a tendency to make the pigs stiff across the loins, which would retard their growth, and sometimes cause death. The sty should be roofed with straw, be well ventilated, and kept thoroughly clean. It was decided that meetings should be held alternately at Bullaparinga and Second Valley on the first Saturday in each month.

#### TATIARA (Average annual rainfall, 19in.).

February 25th.—Present: 15 members.

WORKING FALLOW LAND.—In the course of an address on this subject, Mr. H. G. Fisher said that fallow and fertilisers were the two most important factors in the production of good crops. The results of either of these methods in farming showed up so effectively that at a distance of half a mile it would be possible to distinguish what land had come under their influence. His experience being obtained on light, loamy soil, his remarks might not apply to heavy land; but he had found fallowing of inestimable value, and for the soil he had to deal with, it was best to start operations immediately after the first good winter rain. Where the soil was clean, it should be cultivated twice before harvest, and three times after, with the spring cultivator. One cultivation immediately before sowing was most necessary. With that method, and 100lbs. of super and 60lbs. of seed wheat to the acre, he had succeeded in producing a 27bush. average. "Leave no rubbish to feed take-all" was Mr. Fisher's axiom, for stinkwort and other rubbish at the bottom of the furrow invited take-all, especially in early-sown crops. Cereals sown in May only produced 10bush. to the acre, while those sown in mid-July yielded 27bush. The best conditions seemed to be a solid seed bed and a well-worked surface. Some farmers advocated rolling fallow, but his experience was that after working the land five or six times, the horses' feet did all the rolling that was necessary, and in some instances it had been found that a flock of sheep could perform the same operation quite successfully.

**KALANGADOO**, February 25th.—Consideration was given to matters pertaining to the forthcoming Conference of South-Eastern Branches, to be held at Mount Gambier. Several other subjects of local interest were also brought forward for discussion.

**KYBYBOLITE**, March 16th.—The meeting was devoted to a debate on the various breeds of dairy cattle, Mr. S. Shepherd taking the Jersey, Mr. P. A. Lawrie the Shorthorn, and Mr. L. S. Davie the Ayrshire. Each gave a very interesting and instructive speech dealing with the respective values of the different breeds as milkers, and their value as beef cattle on completion of the period of profit at the pail. A good general discussion followed. Several members stated that they intended to breed Ayrshires, on account of their capabilities of withstanding hardships and having the advantage of cheap service of good bulls at the Experimental Farm. All advocated breeding pure breeds and keeping up the strain by selection.

**TATIARA**, January 28th.—The Chairman (Mr. A. A. Fisher) delivered an address, "Pooling Wheat," and an interesting discussion followed.

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**DURABLE HOME**

**D**URABESTOS is the most permanent and perfect home building sheet. It is made of Asbestos-Cement, a material like marble for durability. As easy and economical to erect as wood lining.

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### **THE LATE JOSIAH PAULL, FIELD ENGINEER OF THE DEPARTMENT OF AGRICULTURE.**

It is with the utmost regret that we record the untimely decease of Josiah Paull, Field Engineer in the Department of Agriculture. Born in February, 1864, he first joined the Public Service in June, 1880, as Surveyor in the Works and Buildings Department. His connection with the Department of Agriculture began with his appointment as Teacher of Surveying at the Roseworthy Agricultural College in 1905. Finally, in 1916, when we were overwhelmed with work in connection with Soldier Settlement, he was appointed Field Engineer to the Department, in which position he rendered the State yeoman service.

Our personal acquaintance extended back to over quarter of a century; and I know of few men who were more completely absorbed in their work. The State has had few better servants. Loyal to the core, outspoken, never sparing himself, yet thoughtful of others, he was a man whom to know was to appreciate. A retiring disposition was, perhaps, one of his most characteristic features; he was content to do his work, but shunned the limelight. He had a heart of gold, and all who were privileged to know him will mourn the loss of a friend and a man.

Our respectful sympathy is extended to his bereaved relatives.

A. J. P.



## POINTS FOR PRODUCERS.

### **Conference of Ministers of Agriculture.**

The 1922 Conference of Ministers of Agriculture will be held at Perth, Western Australia, and will commence on May 29th. The Department of Agriculture will be represented by the Minister of Agriculture (Hon. T. Pascoe), who will be accompanied by his Secretary (Mr. W. L. Summers), the Director of Agriculture (Professor Arthur J. Perkins), and the Manager of the Produce Department (Mr. G. A. W. Pope).

### **Winter School at Roseworthy Agricultural College.**

Arrangements have been made for a short course of instruction for farmers to be held at Roseworthy Agricultural College during the winter. The course will open on Monday, July 17th, and continue during that and the succeeding week. A programme has been arranged, in which practical demonstrations and lectures by officers of the College staff and of the Department of Agriculture have been judiciously blended. The various Branches of the Agricultural Bureau throughout the State have been invited to nominate, in order of preference, persons prepared to attend this course.

### **River Murray Pruning Competitions, 1922.**

The annual pruning competition for Branches of the Bureau on the River Murray settlements will be inaugurated at Berri on Tuesday, June 13th, and will be followed by competitions at the following centres:—Renmark—Wednesday, June 14th; Waikerie—Tuesday, June 20th; Moorook—Wednesday, June 21st. Championship competitions will be held at Waikerie on Thursday, June 22nd. Mr. C. G. Savage (Manager of the Berri Experimental Orchard) has been appointed Secretary and Mr. H. Lehmann Assistant Secretary to the Competitions Committee.

### **Destruction of White Ants.**

In reply to a correspondent who sought information regarding the destruction of white ants in timber to be used for a frame house, the Field Engineer (Mr. J. Paull) said:—"It is usual to give oregon two coats of white ant solution, of which there are a good many preparations on the market, and which mainly consist, I believe, of arsenic. Another method that is sometimes adopted is to soak the timber for 24 hours, or longer, in a solution of arsenite of soda or copper sulphate, 1lb. to the gallon. After the timber has become dry it can be coated with coal tar, with the exception, of course, of the upper sides of flooring-boards. Creosoted wood also will resist white ants. The studs need only be treated about 3ft. up from the bottom. A good plan to

drive the ants from the site on which it is proposed to erect the building is to spread old pieces of sacking moistened with arsenite of soda, dissolved in a small quantity of hot water to which treacle or sugar is added. Another device is to spread a fairly thick layer of cinders and ashes under the floors of the house and dress the surface with coal tar. It is hard to say which method is cheapest and best—all manufacturers of white ant poison claim their product to be best and cheapest. Try the arsenite of soda, as in my opinion it should last longer than simply coating the surface and ends with a preparation which is bound to lose its effect fairly soon."

## DEPARTMENTAL DOINGS.

### GENERAL AGRICULTURE.

During the past month the Director of Agriculture (Professor Arthur J. Perkins) attended the Moonta and Mount Gambier Bureau Conferences, and addressed the settlers at Moorak in connection with the formation of a Herd Testing Society. In company with Mr. F. Hiam (Agricultural Adviser to the British Empire Exhibition) the Director visited Roseworthy Agricultural College.

The Superintendent of Experimental Work (Mr. W. J. Spafford), in company with Mr. R. H. Macindoe, B.V.Sc., M.R.C.V.S. (Veterinary Surgeon) and the Secretary of the Advisory Board (Mr. H. J. Finnis) visited and addressed a number of Branches of the Agricultural Bureau on Eyre Peninsula.

The Instructor for Mallee Lands (Mr. C. P. Hodge) attended the Moonta Conference, and delivered addresses before the following Bureaux:—Taplan, Wynarka, and Keith.

### DAIRYING.

The Dairy Expert (Mr. P. H. Suter) visited the following dairying centres:—Kadina, Murray Bridge, Tantanoola, Strathalbyn, and Kalangadoo. Addresses were also delivered by this officer at the Yorke Peninsula and South-Eastern Conferences.

Mr. H. J. Apps (Assistant Dairy Expert) lectured to members of the Agricultural Bureau at Rockwood and Meadows. Visits were also paid to butter factories at Meadows and Strathalbyn and suburban dairies.

### POULTRY.

The Poultry Expert (Mr. D. F. Laurie) addressed meetings of the Bureau at Mypolonga and Pinnaroo. A visit of inspection was made to a number of poultry farmers in the Pinnaroo district, and advice tendered concerning the housing and raising of the birds.

## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"W. A. W.," Lowaldie, reports cow, the day after calving, developed acute stiffness of hindquarters.

Reply—The difficulty in breathing and opening of the mouth at each breath suggests that she has mechanical pneumonia. You should therefore discontinue the gruel, and do not drench her any further with medicine. Try and tempt her appetite by frequently offering her small quantities of light, easily digested food, especially a little green stuff if you can procure it. Give her powdered nuxvomica, one flat teaspoonful, twice daily mixed with a little treacle, and placed on the tongue, or if you are unable to procure this preparation use tincture of nuxvomica, one tablespoonful, twice a day, given in the same manner. You can thicken it up with a little pollard or treacle.

"A. B.," Parilla, has horse with an old affection of the eye, which has lately caused the pupil to protrude.

Reply—The best treatment in this case would be to have the remains of the eye removed by a veterinary surgeon. Failing this, you should dress it daily with hot boracic solution made by dissolving one tablespoonful of boracic acid in a quart of water.

Secretary, Agricultural Bureau, Meadows, asks cause of sudden blindness of sow.

Reply—It is difficult to give an opinion without further information regarding the appearance of the eye, whether blindness is complete, and the length of time present, &c. Sudden blindness in which there is no marked alteration in the eye may be due to disease of the optic nerve. It is known as "glass eye" from the peculiar appearance of the eye, and if not due to pregnancy, debility, or excessive bleeding, is usually incurable.

Hon. Secretary, Agricultural Bureau, Iron Bank, reports cow, calved three months, with clots resembling cream in the first milk drawn from the off back teat.

Reply—The clots resembling cream are fragments of caesin, and are due to a mild subacute form of mammitis. Milk this quarter last. Strip it out carefully and thoroughly. The milk should soon become normal again. Do not use it until it does so.

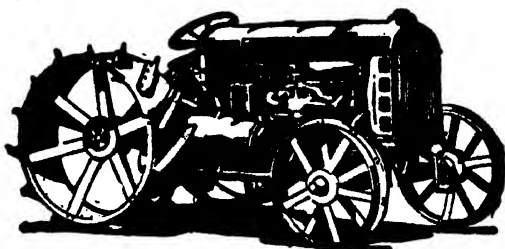
"F. P.," Lake Wangary, has aged light mare subject to scouring and in low condition.

Reply—The mare is aged, and may have defective teeth, which would account for the symptoms. Have an inspection made of the mouth, and, if necessary, attend to any dental trouble. If this examination does not provide sufficient explanation for her low condition, &c., treat her for worms with Fowler's solution. Give one tablespoonful twice daily in the feed for a fortnight. She also requires special feeding and only light work.



## POWER FARMING.

YOU need power for driving your chaffcutter, for your pumping, for your threshing, power for hauling heavy loads about the farm, power for an endless number of jobs, and all this power is available in the



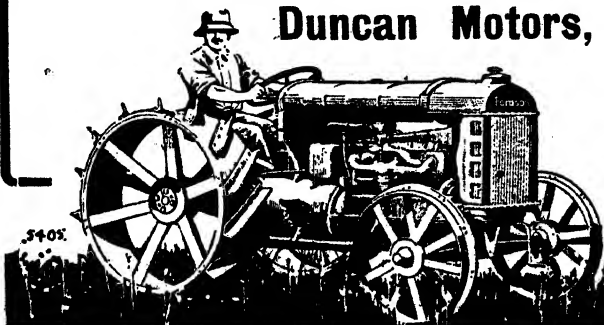
## FORDSON FARM TRACTOR

which will travel to the very spot required and perform its work at a minimum cost. There is not a job that the "Fordson" cannot do better than horses and as satisfactorily as any stationary farm engine. When the ploughing and discing and seeding time comes along the "Fordson" will perform the work of eight horses on such operations, and do it better and cheaper in every way. No farmer who wants to run his farm economically and profitably can do without the Fordson.

FULL PARTICULARS FOR THE ASKING.

**Duncan Motors, Ltd.,**

50, Franklin  
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Adelaide.



Hon. Secretary, Agricultural Bureau, Lake Wangary, reports death of cattle. First symptoms, lost use of hind quarters, very little use of fore legs, poor appetite. Cattle in good condition.

Reply—The symptoms suggest that the deaths of cattle in your district are due to toxæmia. This disease is usually associated with depraved appetite. The use of salt and bonemeal is recommended, and it can be given in the form of a lick by mixing equal parts of sweet bonemeal and coarse salt. It would be more satisfactory, however, if given in the feed at the rate of 1oz. of each daily. Hand feeding on bran and chaff will also be helpful in preventing the trouble.

"F. C. B.," White's Flat, has cow with one teat which is difficult to milk.

Reply—You will require a teat dilator. The teat should be stretched with this instrument every two or three days, and it will need from three to five courses of treatment. Insert the dilator so as to stretch the canal of the teat, and leave it in position for a minute or two; remove it, and after a similar interval repeat the process. Repeat this six or seven times at each treatment. Sterilise the instrument each time before using by boiling for five minutes. Cleanse the teat carefully before treatment. Do not attempt too much at a time.

"T. G. B.," Robe, seeks information concerning balls from the stomach of sheep.

Reply—These balls or concretions are composed of fine vegetable hairs which are felted together by the movement of the stomach. Vegetable hairs which may give rise to these balls or false calculi occur on many plants such as cotton bush, causing cotton balls, and round the seed of wild oats, giving rise to "oat hair" calculi. Undoubtedly you have on your heath lands and cutting-grass flats a plant which possesses fine vegetable hairs of similar character.

"F. K. G. R.," Wild Horse Plains, has bay filly two and a half years old with a lump on shoulder.

Reply—You should apply a blister to the swelling. Use red blister, made by mixing ½oz. of red iodide of mercury with 1oz. of lard. Rub this in well for five minutes. Tie her head up short for an hour after blistering. If necessary, give another application in a fortnight. The swelling will probably disperse gradually, but it may result in the formation of an abscess. In this case you should evacuate it with a clean, sharp knife.

[Replies supplied by F. MURRAY JONES, B.V.Sc., M.R.C.V.S. Government Veterinary Surgeon.]

"H.W.S.," Modbury, reports horse in poor condition, swollen sheath, and passes thick dark urine.

Reply—Examine the teeth carefully for condition that may interfere with proper mastication of food. Continue with the use of Fowler's solution of arsenic, one tablespoonful twice daily in food. Water from a bucket into which the following powder has been placed:—Epsom salts, 1oz.; powder saltpetre, ½oz.; once daily.

Hon. Secretary Agricultural Bureau, Port Elliot, reports death of calf soon after being fed with skim milk and pollard.

Reply—Death was most likely due to gastritis, probably induced by an excess of pollard in the diet. Pollard, though frequently fed to calves, is not an ideal substitute for fats removed from whole milk. Linseed cake or cocoanut oilcake, beginning at a fortnight, with ½oz., gradually increasing to 4ozs. as the animal gets bigger, is preferable. Finely ground maize heads is an excellent substitute. Whatever is used, the food must be fed in a warm state.

Hon. Secretary Agricultural Bureau, Yeelanna, asks cause of green juice escaping from ewe's mouth.

Reply—In this case the probable explanation is that the green juice was part of stomach contents which was vomited or escaped as result of relaxation of muscle fibres normally responsible for closing the "door" after the food has entered the stomach. The color is simply due to the nature of food content. Without an analysis it does not assist in determining the cause of death in this particular case.

"L.B.F.," Alawoona, has five-year-old gelding with hard swelling under jaw, and also one on the side of the head. Horse experiences considerable difficulty in drinking.

Reply—Isolate from other animals, water and feed separately. Apply liniment of turpentine to swelling under jaw, also on neck. When softened so that pus can be detected, the swelling must be opened by point of a sharp knife. After removal of pus, irrigate out each abscess with solution of lysol, one teaspoonful to a pint of water. Give Epsom salts, 8ozs., and saltpetre, 1oz., in bucket of drinking water once daily. If difficulty in breathing, steam with nosebag, 2ozs. turpentine, 1oz. eucalyptus, 1 pint boiling water. Place handful of straw in bottom of nosebag, and eucalyptus and turpentine, then boiling water. Steam for 15 minutes. Allow fresh air to be breathed occasionally. Rug carefully. Food—Warm mash, moistened hay, and green foods.

"S. & Son," Ceduna, reports mare very stiff in hindquarters.

Reply—Give linseed oil, one pint. Apply the following to tendons of back legs:—Salad oil and table vinegar, equal parts, once daily. Food—Bran mash, hay, green feed. Complete rest for 10 days.

"E.R.M.," Borrika, reports (1) pony in fair condition, frothing extensively at mouth and nose. When head is lowered to drink, a yellowish discharge comes into the mouth. Pony has been isolated. (2) Young boar, recently castrated, but the wound has not healed.

Reply—(1) Pony mare.—Continue isolation and water from a separate bucket. Examine under the jaws for abscess swellings and also below the ears. If noted, foment, or apply a liniment. If pus detected, you must release with point of sharp knife. Steam animal with a nosebag or bucket, in bottom of which has been placed a handful of straw, 2ozs. turpentine and eucalyptus; afterwards pour on top a pint of boiling water. Steam the head carefully for 10 to 15 minutes, taking care to allow a little fresh air in occasionally. Place in a bucket of drinking water 3ozs. of Epsom salts and 1oz. saltpetre. Place the bucket so that the animal can reach it without lowering head. Keep animal lightly rugged. Food—Warm mash, moistened hay, or green feed. (2) Young Pig.—Bathe the part with lysol, a teaspoonful to pint of warm water. If no lysol, use strong Condy's solution. Afterwards syringe solution into wound. Place animal under clean conditions.

Hon. Secretary Agricultural Bureau, Rendelsham, reports heifer falls down suddenly, and almost unable to rise unaided.

Reply—It would appear from the description to be a symptom of brain trouble. There has possibly been an injury to the head. A definite diagnosis would require a personal examination. Give the following:—Epsom salts, 8ozs.; powdered ginger, 1oz.; treacle, 3ozs.; warm water, 1 pint. Dissolve the first three in the water and give as a drench.

## 60% PHOSPHATES

finely ground will greatly benefit your fruit trees or vines.

90s. per ton on trucks, Port Adelaide.

## "CRUSADER" PETROL

QUICK STARTING. - FULL POWERED.

**Arthur H. HASELL, PORT ADELAIDE,**  
MANUFACTURER and IMPORTER.

## ORCHARD NOTES FOR SOUTHERN DISTRICTS.

[By C. H. BEAUMONT, Orchard Instructor.]

Those who have fruit in the cool store will need to examine it at intervals, and get out anything which shows signs of deteriorating. The cool store is the best friend of the fruitgrower, but is not yet thoroughly understood, and does not get a fair chance of proving its worth, because of the varying types of fruit placed in storage. To keep well, the fruit must be fresh, but it should not be hot from the tree; it must be full grown, yet not overripe, and it should be from mature trees. It matters little whether it is wrapped or not.

Pruning and ploughing will be the principal work this month. If you are in doubt about your pruning, write to the Department and ask that an Instructor should call on you and demonstrate the methods to be used; but if you start cutting, be sure that you do not cut out too much on the trees in bearing. If you keep your soil well worked and loose you will get the best results from it; it is good now to plough to the trees and leave it in the clod. On hillsides liable to wash, put in some barley or peas as a cover crop, which may be ploughed in later on in the season.

Make provision for dealing with surface flood waters. This is most essential if we wish to keep the soil in its right place. Wet soils require under draining; this is not so difficult a matter as many suppose, and it is of great benefit to the soil and thus to the trees.

The fruit season is practically over. Some thousands of bushels of fruit have been wasted by disease, which was preventable, and also by want of care in handling. The result is that already we are importing fruit from the other States. This should not be, especially when we consider the fact that no other State has the same natural advantages as South Australia.

If possible get on with the planting of fresh trees, taking care to secure good trees from the nursery and the land well prepared.

### GRAIN GROWERS!

Please Note—

WHEN MARKETING YOUR

**WHEAT, OATS, BARLEY, PEAS, CHAFF, &c.,**

IT WILL PAY YOU TO GET IN TOUCH WITH

**CHARLES WHITING,**

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**CENTRAL MISSION BUILDINGS, ADELAIDE.**



Mr. Leslie Cowan's "Melford's Majesty." A great performer. Yielding 10,468 lbs. milk and 648 6/16 lbs. butter, worth £48 per year.



## OFFICIAL HERD TESTING.

## MR. LESLIE COWAN'S HERD OF JERSEYS.

The Jersey herd belonging to Mr. Leslie Cowan, of "Dalebank," Blakiston, has been under official test by the Department of Agriculture since 1916. The following tables set out in detail the records of each cow in the herd each year from 1916 till 1921:—

Name of Cow	Date of Calving	Date of Entry to Test	Date of Test Completed	Weight of Milk Last Day of Test	Weight of Milk for Period	Average Test	Butter Fat	Estimated Butter 15 % overrun	Butter Fat Standard
				Lbs	Lbs	%	Lbs	Lbs	Lbs
YEAR 1916.									
Lady .....	30/10/15	6/11/15	5/8/16	5	4,333	4.75	206.17	237.05	250
May X. ....	26/3/16	3/4/16	31/12/16	15	4,259½	5.66	241.49	277.67	250
Grand Girl ..	12/3/16	19/3/16	17/12/16	21	5,619	4.22	239.20	275.04	200
Defender's Queen VII.	16/2/16	23/2/16	21/11/16	20½	5,172½	5.79	299.93	344.88	250

YEAR 1917.									
Noble's III. Carnation ....	23/4/16	1/5/16	28/1/17	13½	4,283	5.29	226.63	260.58	175
Princess .....	21/6/16	20/6/16	28/3/17	10½	6,810	5.03	333.00	382.90	250
Molly .....	18/6/16	26/6/16	25/3/17	19½	7,527½	5.20	392.09	450.67	250
Flavia III. ....	18/7/16	26/7/16	24/4/17	14	5,952	5.38	320.77	368.93	175
Lady McEwin VI. ....	23/7/16	31/7/16	29/4/17	14½	6,159½	5.42	354.08	381.16	200
Sheila .....	25/7/16	2/8/16	1/5/17	16½	6,392	5.69	373.13	429.05	200
Lady Grey VII. ....	18/8/16	26/8/16	25/6/17	15	5,483	5.58	306.07	351.93	200
Madge .....	18/8/16	26/8/16	25/6/17	15	7,484½	5.48	406.77	467.74	200
Molly Bawn VIII. ....	13/8/16	21/8/16	20/5/17	15	5,339½	5.18	276.53	317.97	250
Lady .....	31/8/16	7/9/16	6/6/17	12½	5,836½	5.37	313.45	360.43	250
Clematis .....	13/10/16	20/10/16	19/6/17	12	4,980	5.57	275.20	316.45	175
Rhodora III. ....	5/11/16	12/11/16	11/8/17	15½	5,065½	5.19	263.25	302.68	175
Maitland's Joy .....	18/11/16	25/11/16	24/8/17	16	5,145½	5.48	282.29	324.60	200
*Nancy .....	16/12/16	23/12/16	31/8/17	12½	4,280	5.66	242.77	279.14	200
† Defender's Queen VII. ....	11/3/17	18/3/17	23/9/17	21	4,295	5.89	253.14	291.08	250
† Barbara XIII. ....	23/3/17	31/3/17	4/9/17	25	5,238	5.33	279.55	421.45	250
† Lady Grey VII. ....	1/8/17	8/8/17	3/9/17	20½	746	5.0	37.30	42.88	250
Twinkling Star .....	12/3/17	19/3/17	16/12/17	7	6,324	5.36	339.40	390.26	250

\* 252 days only.

† 170 days only.

‡ 158 days only.

§ This cow was only 27 days under test.

Died 3/9/17.

YEAR 1918.									
Flavia of Dalebank .....	7/7/17	14/7/17	12/4/18	12½	4,466½	5.21	233.03	260.96	175
Noble's III. Carnation .....	12/6/17	19/7/17	18/3/18	15	6,134½	5.73	351.87	404.60	200
Molly .....	29/6/17	6/7/17	4/4/18	19	8,589½	5.47	470.28	540.78	250
Madge .....	1/8/17	8/8/17	7/5/18	16	7,269	5.61	407.81	468.93	250
Sheila .....	20/8/17	27/8/17	26/5/18	19	7,475½	5.46	408.82	470.10	250
Rhodora III. ....	24/9/17	1/10/17	30/6/18	13	6,474½	5.32	344.46	396.08	175
Princess .....	14/9/17	26/9/17	20/6/18	16	6,720	4.99	335.95	386.31	250
Queen of Sheba .....	26/9/17	2/10/17	2/7/18	14½	4,787	5.43	260.06	299.05	200
Twitter .....	14/10/17	21/10/17	20/7/18	14	4,618	4.71	217.60	250.22	175
Firefly .....	23/10/17	30/10/17	29/7/18	10	3,773	4.93	186.21	214.09	175
Melford's Majesty .....	23/10/17	30/10/17	29/7/18	19	5,955½	4.89	291.61	335.32	175
Clematis .....	5/2/18	12/2/18	11/11/18	23	7,331	5.06	371.62	427.32	200
* Mystifer's Annette .....	13/12/17	20/12/17	12/8/18	9	3,022	5.08	153.53	176.52	175
Twinkling Star .....	3/3/18	10/3/18	7/12/18	11	6,031	5.32	320.58	368.92	250

\* This cow was submitted 236 days only.

YEAR 1919									
Flavia III. ....	12/8/18	19/8/18	28/2/19	21	5,743	5.51	316.83	361.32	250
Molly .....	27/7/18	3/8/18	3/5/19	16	8,775	5.47	480.35	552.36	250
Madge .....	2/8/18	9/8/18	9/5/19	12	7,034	5.41	390.60	437.64	250
Noble's III. Carnation .....	7/7/18	14/7/18	13/4/19	14	6,028½	5.45	361.40	415.58	250
Lady McEwin .....	24/7/18	31/7/18	28/4/19	18	8,406½	5.45	458.45	527.18	250
Rhodora III. ....	29/9/18	6/10/18	6/7/19	19	7,073½	5.48	387.96	446.13	200
Sheila .....	29/9/18	6/10/18	6/7/19	12	7,316	5.34	361.15	449.79	250
Twitter .....	19/10/18	26/10/18	25/7/19	14	6,170	5.31	327.97	377.11	200
Queen of Sheba .....	22/10/18	29/10/18	28/7/19	12	6,046	5.58	337.64	388.24	200
Melford's Majesty .....	6/11/18	13/11/18	13/8/19	14	7,377	5.60	413.83	475.87	200
Clematis .....	23/11/18	30/11/18	29/10/19	18	6,546	5.39	353.42	406.38	250
Mystifer's Annette .....	22/12/18	29/12/18	27/9/19	15	4,065	5.33	264.64	304.30	200
Twinkling Star .....	3/3/19	10/3/19	8/12/19	14	6,990½	5.41	378.49	435.22	200

Flavia III.—194 days only.



Mr. Leslie Cowan's "Twitter." A profit maker. Yielding 8,425 lbs. milk and 513 1/4 lbs. butter, worth £38 9s. 6d., in 273 days.

MR. LESLIE COWAN'S HERD OF JERSEYS—*continued.*

Name of Cow	Date of Calving	Date of Entry to Test	Date of Test Completed	Weight of Milk Last Day of Test	Weight of Milk for Period	Average Test	Butter Fat	Estimated Butter 15 % overrun	Butter Fat Standard
				Lbs	Lbs	%	Lbs	Lbs	Lbs
YEAR 1920.									
Defender's Queen of Dalebank	26/4/19	3/5/19	30/1/20	12½	6,664	5.43	361.84	416.07	250
Lady Grey of Dalebank	26/7/19	2/8/19	2/5/20	10	5,090	5.09	259.26	298.11	175
Anemone	8/7/19	15/7/19	14/4/20	13	6,364	5.22	332.67	382.52	250
Noble's III. Carnation	16/7/19	23/7/19	1/5/20	8	6,229	5.36	334.29	384.40	250
* Molly	3/8/19	10/8/19	28/1/20	25	6,050	5.43	329.70	377.97	250
† Madge	1/8/19	8/8/19	7/5/20	16½	7,173½	5.35	384.17	441.75	250
Duchess III. of Dalebank	3/8/19	10/8/19	10/5/20	15½	6,574	5.2	341.90	393.14	175
† Shela	24/9/19	1/10/19	31/5/20	16	6,010	5.4	324.83	373.51	213
§ Rhodora III	10/10/19	17/10/19	9/5/20	13	5,345	5.07	271.44	312.12	250
Twitter	14/10/19	21/10/19	21/7/20	7	6,142½	5.41	333.21	383.14	250
Queen of Sheba	14/10/19	21/10/19	21/7/20	14½	5,636	5.39	304.26	349.66	250
Butterfly of Dalebank	18/10/19	25/10/19	25/7/20	8	4,064	4.83	190.84	225.74	175
Lucy of Dalebank	14/10/19	21/10/19	21/7/20	12½	5,151	5.09	263.42	301.74	175
Melford's Majesty	16/11/19	23/11/19	21/8/20	9	5,823	5.47	319.08	366.90	250
Flavia III.	9/2/20	16/2/20	16/11/20	14	4,451	5.30	236.12	271.49	250
Lady McEwin IV.	3/2/20	10/2/20	10/11/20	18	5,943	5.37	310.46	367.32	175
Rhoda	14/1/20	21/1/20	21/10/20	6	4,501	4.10	184.61	212.26	175
Twinkling Star of Dalebank	18/2/20	25/2/20	24/11/20	6½	3,076	5.11	157.22	180.74	175
Defender's Queen II. of Dalebank	11/3/20	18/3/20	16/12/20	18	5,216	5.07	264.91	304.59	250

\* 171 days only.

† 266 days only.

‡ 213 days only.

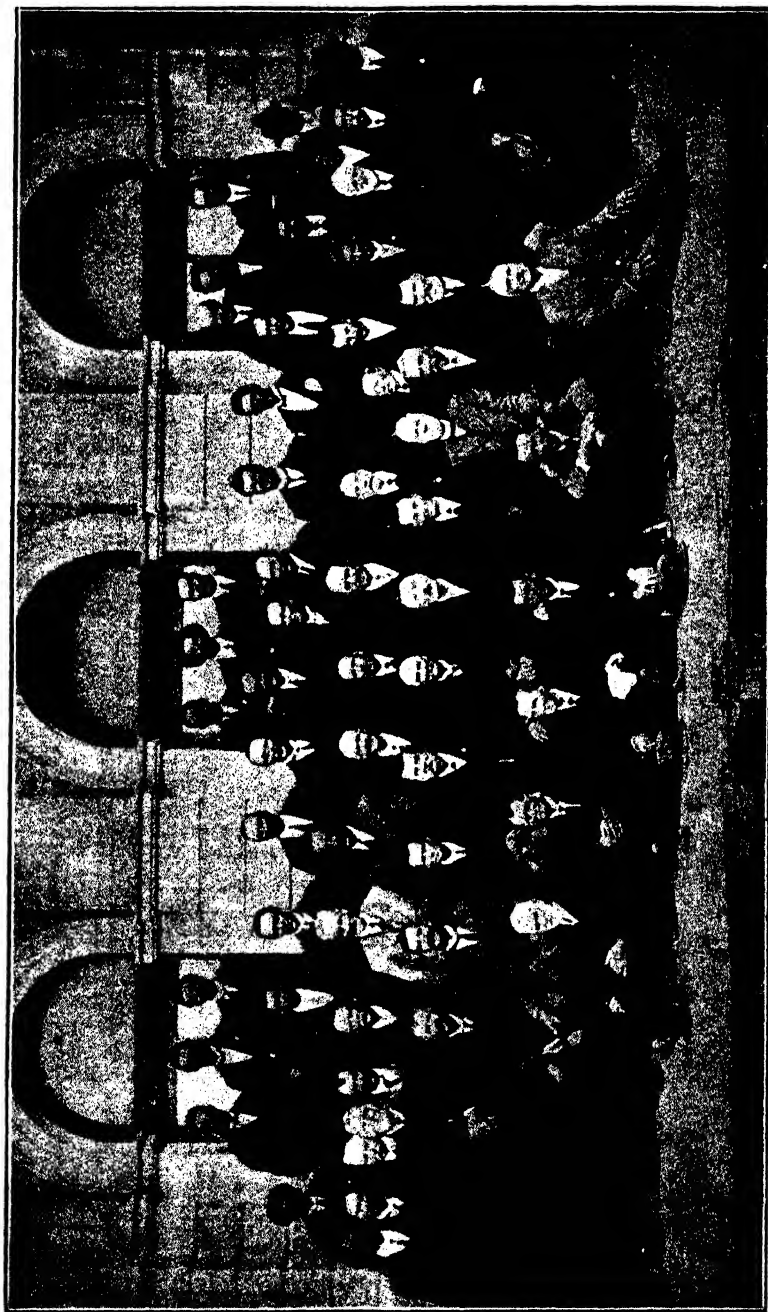
§ 204 days only.

## YEAR 1921.

Name of Cow	Entered Test	Completed Test	Milk	Fat	C.B 15 % Overrun	Average Test	Butter Fat Standard
			Lbs	Lbs	%	%	Lbs
Annette of Dalebank	18/5/20	15/2/21	5,560	290.37	333.89	5.22	175
Dido of Dalebank	17/8/20	16/5/21	4,290	243.12	297.53	5.65	200
Noble III. Carnation	5/8/20	5/5/21	7,121	409.77	471.18	5.75	250
Shela II. of Dalebank	31/7/20	30/4/21	6,674	344.62	396.28	5.16	200
Glory II. of Dalebank	6/8/20	6/5/21	5,549	297.36	341.92	5.35	175
Countess of Dalebank	24/8/20	23/5/21	4,245	235.72	271.04	5.55	175
Firefly III. of Dalebank	29/8/20	28/5/21	4,749	262.34	301.66	5.52	175
Twitter	15/9/20	15/6/21	8,425	446.49	513.41	5.20	250
May II. of Dalebank	5/9/20	5/6/21	5,323	284.46	327.07	5.34	175
Flavia of Dalebank	29/9/20	28/6/21	6,962½	384.98	442.68	5.52	250
Butterfly of Dalebank	14/10/20	14/7/21	5,457	296.49	340.91	5.42	175
Anemone	16/10/20	16/7/21	7,162	377.36	433.92	5.26	250
Queen of Sheba	21/10/20	10/7/21	6,529	364.00	418.55	5.57	250
Lucy of Dalebank	1/11/20	31/7/21	6,772	354.85	408.04	5.24	200
Melford's Majesty	5/10/20	6/7/21	8,689	456.41	524.83	5.25	250
Lady McEwin IV	10/1/21	10/10/21	7,663	410.75	472.31	5.36	250
* Melford's Majesty	5/10/20	4/10/21	10,486	561.45	645.62	5.35	250

\* 365 days test.

In commenting on the above results of Mr. Cowan's Jerseys, the Dairy Expert (Mr. P. H. Suter) says:—Looking over the records of 1921, the last record completed, it will be seen what a wonderful return has been given in milk and butter by every member of the herd. Taking those on the third calf or over period of lactation, covering the 273 days' test in the year, we find that every animal has yielded so generously that the remarkable average of 465lbs. of butter per cow has been recorded during that period, a performance of which any herd owner in the world might well be proud. Expressed in £ s. d., the butter being sold at 1s. 6d. per lb., the herd shows a gross return of £34 17s. average per head over a 273 days' milking period. The richness of the milk is exceptional, showing the high butter fat average of 5.4 per cent.



Some of the Delegates and Officers of the Department of Agriculture who attended the 1922 Conference of the Yorke Peninsula Branches of the Agricultural Bureau.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

### CONFERENCE OF YORKE PENINSULA BRANCHES.

The 1922 Conference of Yorke Peninsula Branches of the Agricultural Bureau was held at Moonta on Wednesday, April 12th, 1922. The opening address was delivered by the Hon. T. Pascoe, M.L.C. (Minister of Agriculture), and the Department of Agriculture was represented by the Director of Agriculture (Professor Arthur J. Perkins), the Chairman of the Advisory Board of Agriculture (Mr. C. J. Tuckwell), the Dairy Expert (Mr. P. H. Suter), the Instructor for Mallee Lands (Mr. C. P. Hodge), and Mr. F. C. Richards, representing the Secretary of the Advisory Board of Agriculture.

Mr. A. B. Ferguson (President of the Moonta Branch) presided over the gathering, and delegates from the following Branches were present:—Arthurton, Maitland, Moonta, Paskeville, Balaklava, Butler, Bute, Kadina, Yacka, Kilkerran, and Brentwood.

The Director of Agriculture (Professor Arthur J. Perkins) and the Dairy Expert (Mr. P. H. Suter) delivered addresses, and the following papers were contributed:—"Boy Immigration for Farm Apprentices," Mr. T. Howlett (Arthurton); "The Farmer's Wife," Mr. H. J. Cadd (Moonta); "Sheep and the Blowfly Pest," Mr. J. Houner (Brentwood); "Destruction of Rabbits," Mr. C. Williams (Arthurton); "Care and Management of Implements and Machinery," Mr. L. E. Young (Paskeville); "Preparation of Seed Wheat," Mr. J. Bussenchutt (Paskeville). It was decided that the 1923 Conference should be held at Minlaton.

### CONFERENCE OF SOUTH-EASTERN BRANCHES.

The Annual Conference of South-Eastern Branches of the Agricultural Bureau was held at Mount Gambier on Wednesday, April 26th. There was a good attendance of members and delegates representing the following Branches:—Mount Gambier, Moorak, Millicent, Kybybolite, Kalangadoo, Glencoe, Coonawarra, and Penola. The President of the Mount Gambier Branch (Mr. W. Manser) presided, and the Department of Agriculture was represented by the Director of Agriculture (Professor Arthur J. Perkins), the Dairy Expert (Mr. P. H. Suter), and the Secretary of the Advisory Board (Mr. Harold J. Finnis). The Director of Agriculture delivered the opening address, immediately after which a paper dealing with telephones for rural districts, written by Mr. R. Hunt (Tatiara), was read. This was followed by papers entitled "Afforestation," Mr. S. H. Schinckel (Naracoorte), and "Farming Methods Abroad," Mr. S. J. Bonney (Glencoe). The afternoon session was commenced at 2.15, when Mr. P. H. Suter (Government Dairy Expert) delivered an address, "Dairying." Professor Perkins then addressed the meeting, and answered a number of questions that were brought forward. A paper

entitled "Beautifying the Homestead" was then read by Mr. W. Robinson (Mount Gambier). The following resolution was carried:—"That a Bill be introduced into Parliament to prevent the sale of adulterated bran and pollard."

It was agreed that the next Conference should be held at Kalangadoo during the third or fourth week in April, 1923. A fine exhibition of fruit and vegetables was staged by the members of the Mount Gambier, Moorak, Coonawarra, and Kybybolite Branches.

### IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC.

During the month of March, 1922, 9,428bush. of bananas, 1bush. of grapes, 216bush. of passion fruit, 312bush. of peaches, 331bush. of pineapples, 2bush. of plums, 15,867 bags of potatoes, 22 packages of bulbs, 29 packages of plants, 42 packages of seeds, and 1,799 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910. Of these, 231bush. of bananas (over-ripe), 37bush. of pineapples (over-ripe), and 1bush. of grapes (prohibited entry) were destroyed, and 71 empty wine casks were fumigated.

Under the Federal Commerce Act, 59,980 packages of fresh fruit, 6,854 packages of dried fruit, 5 packages of honey, 50 packages of onions, and 1 package of seeds were exported to oversea markets. These were consigned as follows:—To London—55,747 packages of apples, 2,339 packages of pears, 6,704 packages of dried fruit. To South Africa—150 packages of dried fruit. To Stockholm—925 packages of apples. To India and East—768 packages of apples, 5 packages of honey, 201 packages of grapes, 1 package of seeds, 50 packages of onions.

Under the Federal Quarantine Act, 6,262 packages of seeds, etc., were examined and admitted from oversea sources. Of these, 403 packages of dates were destroyed.

#### *Interstate Imports.—Examined at Mount Gambier, March, 1922.*

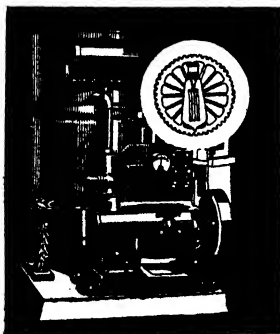
	Packages.	Bushels.
Bananas . . . . .	89	134
Pineapples . . . . .	3	5
Cocoanuts . . . . .	1	—
Apples . . . . .	486	486
Pears . . . . .	26	26
Plums . . . . .	2	2
Cantalopes . . . . .	1	1
Grapes . . . . .	2	2
Oranges . . . . .	2	2

Of these, 1 case of apples (codlin moth) was returned to growers, 1 case of cantalopes (over-ripe), 2 packages of grapes (prohibited entry), and 4 second-hand cases were destroyed, and 2bush. of oranges were fumigated.

## RIVER MURRAY HERD TESTING ASSOCIATION.

## RESULTS OF BUTTERFAT TESTS FOR JANUARY, 1922.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during January.	Per Cow during January.	Per Cow October to January.	Per Herd during January.	Per Cow during January.	Per Cow October to January.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/A	13	7-81	6,537-5	502-88	2,209-81	275-21	21-94	96-64
1/C	27	25-65	19,145	709-07	3,164-93	798-53	29-58	133-28
1/E	17-23	13-0	9,876-5	573-22	2,163-03	394-63	22-90	94-62
1/G	48	38-61	44,380	924-58	3,511-34	1,743-31	36-32	136-29
1/I	10	8-32	6,732	673-20	2,897-15	301-49	30-15	123-85
1/J	16	14-0	10,416	651-00	2,551-12	478-67	29-92	111-72
1/K	15	11-97	9,926	661-73	2,812-60	437-72	29-18	120-68
1/L	13	11-71	7,405	569-62	2,213-54	347-32	26-72	107-87
1/M	19-45	16-45	10,228-5	525-80	2,005-00	460-44	23-67	89-45
1/O	29-26	24-94	16,185	553-14	2,361-91	748-86	25-59	108-25
1/R	19	15-90	8,008-5	421-50	1,507-68	393-65	20-72	73-97
1/S	16	11-06	6,845	427-81	2,043-18	292-25	18-27	88-72
1/T	12-68	9-61	6,464	509-78	1,695-28	317-07	25-01	85-67
1/U	14	12-74	11,261-5	804-39	2,504-84	523-78	37-41	112-17
1/V	16	13-23	8,182	511-38	2,013-01	367-30	22-96	86-65
Mean	19-04	15-67	12,106-17	635-78	2,525-80	526-02	27-62	108-92



## RADIANT Electric Lighting Plants.

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G. S. GIBBINS.

## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Thursday, April 20th, there being present Mr. C. J. Tuckwell (Chairman), Captain S. A. White, Messrs. T. H. Williams, F. Coleman, A. M. Dawkins, H. Wicks, and the Secretary (Mr. H. J. Finnis). An apology was received from Professor Arthur J. Perkins.

*Time of Fixing F.A.Q. Standard.*—A request was received from the Gawler River Branch, asking that the f.a.q. wheat standard should be fixed at least one month earlier than was the case at present. The request was brought under the notice of the Chamber of Commerce, who stated that the Corn Trade Sectional Committee of the Chamber were of the opinion that it would not be practicable to fix the weight of the standard sample any earlier. The standard was for the whole of the State, and it was necessary that a representative number of samples should be received before the f.a.q. was determined on. It was further pointed out that the standard samples were this year fixed in the various States on the dates set out below, viz.:—South Australia, January 26th; Victoria and New South Wales, February 7th; and Western Australia, February 20th. It would therefore be noticed that South Australia was considerably in advance of any of the other States in fixing the sample. The Secretary was instructed to advise the Branch in terms of the above communication.

*Roads for Mallee Districts.*—The 1920 Conference of Murray Mallee Lands carried a resolution asking the Government to provide roads for settlers in the mallee lands districts. Advice was received from the Local Government Department to the effect that a special grant of £300 to the district council of Karoonda has been made for immediate expenditure on roads in the district.

*Proclamation of "Innocent" Weed as a Noxious Weed.*—The Berri Branch asked that the plant locally known as "Innocent Weed" should be proclaimed a noxious weed. On the motion of Capt. White, seconded by Mr. H. Wicks, it was decided to ask the Government to take steps to secure the proclamation of the plant as a noxious weed.

*River Murray Pruning Competitions.*—An intimation was received to the effect that neither the Horticultural Instructor (Mr. Geo. Quinn) nor the Manager of the Berri Experimental Orchard (Mr. C. G. Savage) would be available to act in the capacity of judge at the River Murray Branches Pruning Competitions.

*Resolutions from Mid-Northern Conference.*—The following resolutions were carried:—(a) "That it is the opinion of this Conference that the Act referring to the compulsory dipping of sheep should be strictly enforced." The Chief Inspector of Stock (Mr. T. H. Williams) in commenting on the resolution, said it was his intention in the near future to ask the Minister to vary the Act at present governing the dipping of sheep. For a long time past his department had had practically no trouble with sheep so far north as Gladstone, and the



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**GENUINE IOWA GROWN.**

Every farmer will appreciate the immense value of this splendid clover and secure his supplies early in case of a possible shortage of seed this coming season.

On account of its quick growth Hubam is especially valuable for fitting in the rotation between two winter crops of grain, and will, in a few months, fully restore the humus and nitrogen taken from the soil by the preceding crop.

**BOOK NOW FOR DELIVERY IN AUGUST.**

**THIS SEVEN PURPOSE SHORT SEASON CROP**

1. Can be pastured.
2. Can be cut and fed green.
3. Can be made into excellent quality hay.
4. The seed crop pays well.
5. A wonderful honey plant for bees.
6. A marvellously quick soil restorer.
7. An excellent weed destroyer when sown thickly.

If sown in drills 24 inches apart and drilled carefully, two pounds of seed will be ample to sow an acre.

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inspectors of those districts reported that ticky and lousy sheep were only noticed on very rare occasions. He intended to ask the Government to pass a new regulation whereby owners exposing undipped sheep in any saleyard within a proclaimed area would be guilty of an offence against the Stock Diseases Act. (b) Travelling facilities for Bureau members.—“That this Conference requests that, with a view to fostering interest in Bureau work generally, especially as it applied to young members, that the Government be asked (1) That a free railway pass be issued annually to a percentage of the members of such Branch who qualify for same; and (2) That a membership badge be inaugurated so that members when travelling may be able to recognise fellow-Bureau members.” The Board did not entertain the suggestion.

*Destruction of Red Scale.*—A report was received from the Gawler River Branch, calling attention to the spread of red scale in the gardens in the Gawler district, and it was asked that steps might be taken by the Department to check the spread of the disease by fumigation. It was decided to draw the attention of the Horticultural Instructor (Mr. Quinn) to the matter, and to request that steps should be taken to have the trees fumigated.

*Investigation of Horticultural Problems.*—A communication from the Blackwood Branch directed attention to a number of horticultural problems that growers had to face. It was decided to ask Mr. Wicks to peruse the statement and furnish a report at the next meeting of the Board.

*Shipment of Flour and Superphosphate.*—Correspondence was received from the Coorabie Branch, stating that it was a regular occurrence every year, at the time when farmers were securing super, to find that a certain percentage of all flour brought by the steamer reached port in a most unsatisfactory condition. It was stated that the flour and super were placed in the one hold, and that it was not unusual to see the two commodities discharged from the vessel in the same sling. Cases were cited where the flour bags had burst, and some of the super bags were leaking directly into the flour. On the motion of Mr. F. Coleman, seconded by Capt. White, it was decided to ask the Minister to obtain a report on the matter from the Central Board of Health.

*Afforestation.*—This subject was again brought before the Board, and it was decided to defer consideration until a subsequent meeting of the Board.

*1922 Congress Committee.*—The Director of Agriculture (Professor Arthur J. Perkins), the Principal of the Roseworthy Agricultural College (Mr. W. J. Colebatch), Mr. W. S. Kelly, and the Secretary (Mr. H. J. Finnis) were appointed as a committee to arrange for the 1922 Congress.

*New Branch.*—Approval was given for the formation of a new Branch of the Agricultural Bureau at Tarlee, with the following gentlemen as foundation members:—L. E. Stribling, E. J. and W. H. Thomas, G. N., W., and S. Willis, P. Buckley, J. Devine, M. Nash,

J. O'Sullivan, G. Pillar, W. Potter, A. Reed, J. and H. Sanders, E. F. Kreig, W. S. and J. Kelly, J. McInerney, L. and A. Molineaux, G. Minchin, A. M. Fuller, E. and H. Humphries, A. Hill, T. Hooking, P. Hogan, R. Jackson, E. and E. A. Clark, G. Cornish, L. and H. Clarkson, W. Dawson, W. Edgerly, S. and G. Arthur, W. Branson, M. Badman, D., A., and A. S. Clarke.

*New Members.*—The following names were added to the rolls of existing Branches:—Rosedale—A. H. Wolf. Meadows—A. G. Brownlee, F. Wright, sen., H. Gardiner. Strathalbyn—C. J. Crawford, H. J. Webb, T. Stubing. L. Lord, F. A. Powell, G. Phillips, R. H. Gooch, F. L. Dunn. Kalangadoo—C. Campbell, A. Campbell. Wirrabara—T. Kite. Taplan—D. J. Chancellor, A. J. Blum, F. Moffatt. Second Valley—A. Hamlyn, L. C. Cant, F. Jones, D. G. Carlsson, G. Martin, B. Florence, J. D. Lawless, R. Wash, B. C. Coad, J. Ford. Collie—J. G. Dolphin, J. Ollson. Windsor—M. Jones. Frances—A. Koch, A. Campbell. Mallala—K. C. Catt. Kilkerran—A. Whitelaw, E. Green, J. Donohue, B. J. Koch. Kangarilla—R. G. Morphet, W. Bottrill, F. Baker, W. T. Golder, T. O. Golder, T. Golder, J. Golder, W. Dowling, V. Biddle, E. Butler, C. Butler, G. Butler, W. Nicolle, W. Jackson, F. Steer, W. Jones, R. Bilney, D. Bilney, F. W. Thorpe, L. Smart. Yacka—J. Atkinson, E. Speck. Redhill—G. A. Mazure. Brentwood—A. J. Babbage. Mount Remarkable—J. F. Weeks, E. J. Pride, S. N. Bell, P. A. H. Jennings, P. W. Builder, H. A. Fairweather. Talia—M. Boylan. Roberts and Verran—O. A. Evans. Salisbury—A. Poole. Lone Pine—C. A. Pollitt, M. E. Heuzenroeder, E. G. Hoffmann, J. Hentschke. Balhannah—A. Bevis, C. Prosser. Moorak—W. F. Spencer. Narrung—A. J. Manuel, L. G. Turner, P. Hunt, A. Carruthers, R. S. Carruthers. Geranium—H. Windlebourne. Kongorong—G. Boardman, G. Haywood. Winkie—C. A. Ingerson, D. Little, S. McD. Bradshaw. Booleroo Centre—C. Paterson, H. Collins. Weavers—E. Anderson. Moonta—H. Banfield. Black Springs—A. Duldig, J. Eckert, E. Mickel, B. Heinrich, F. Schuppan. Pygery—E. H. Edmonds, R. Woodrup, H. P. Ingram, G. P. Symonds, C. Symonds, G. T. Turley, F. Kammermann, A. R. Kammermann, J. Masters, H. Harris. North Booborowie—M. L. Gneil. Rockwood—G. R. Holmes. Meadows—M. Manser, P. Stokes. Weavers—H. Cornish. Mount Barker—E. Poole, E. Schwab. Glossop—E. Milburn, G. C. Jackson, E. A. Cornish, A. B. Blake. Clare—T. P. Donnellan. Pygery—W. M. Heath, E. N. Heath, W. M. Smith, G. Duggan. Loxton—H. C. Fricker, S. V. Fuller, J. G. Schulz, jun., C. Stanitzke, J. Marks, T. L. Stapperott, J. H. Thiele, jun., J. Sexton. Orreroo—J. Christall. Second Valley—J. Cussion, B. G. Williss, G. V. J. Roper, D. Johnson. Glencoe—J. Davies. Owen—Jno. Smith, S. Jeffries. Kangarilla—A. Dowling, T. Mutton. Netherton—J. S. Harvey, P. Halls, C. Halls. Miltalie—A. T. Banfield. Aldinga—P. J. McKenzie, A. C. Cliff, H. Cameron, M. V. Martin, J. Mumford. Kybybolite—A. R. Rowe, R. Shepherd, L. Shepherd, A. Shepherd, Milne. Paskeville—L. J. Day, L. Rundle. Narridy—E. Crab, O. Smart, Shaughnessey, K. Saltmarsh, D. G. Sandow, C. Giles. Moonta—A. J. Feder.

## LUCERNE FOR GRAZING.

Writing from Georgetown, a correspondent submitted a number of questions dealing with the cultivation of lucerne, without irrigation, for grazing purposes. To these, the replies set out below have been supplied by the Superintendent of Experimental Work (Mr. W. J. Spafford).

*Question 1.*—Do you think this district suitable for lucerne growing?

*Answer*—The great bulk of the land of the Georgetown district should grow lucerne for grazing fairly well, and on much of the "low" land it should do really well, providing, of course, that it receives proper attention.

*Question 2.*—Would it be best to mix the lucerne seed with superphosphate and drill it in with my oat crop, or seed the oats, then broadcast the lucerne?

*Answer*—To ensure a good stand of lucerne in your particular conditions, the seed should be sown during April on *fallowed* land, but not in conjunction with another crop, and then the superphosphate would be drilled in, between 10lbs. and 20lbs. of lucerne seed broadcasted to the acre, and the land thoroughly rolled. If you have decided to seed with your oat crop, drill in the cereal and broadcast the lucerne seed immediately afterwards; but if the oat crop is to be left to ripen grain, you must remember that you are chancing a stand of lucerne, because it is not at all unusual to experience total failures when tried in this way. When lucerne is seeded with a cereal crop, it should always be with one to be cut for hay.

*Question 3.*—Would it be wise to roll after seeding?

*Answer*—Small seeds should always be sown at a very shallow depth, and as the roller is the only common farm implement which will do this, it is the correct practice to adopt.

*Question 4.*—Is a dressing of 120lbs. of superphosphate per acre sufficient, and should it all be applied at seeding time?

*Answer*—Unless the lucerne crop is to receive an annual application of phosphatic fertiliser, 120lbs. per acre of superphosphate is only a light dressing, and at least that quantity should be drilled in at seeding.

Stated briefly, concluded Mr. Spafford, my idea of growing lucerne for grazing, without irrigation, in your particular conditions is as follows:—

- (a) Seed on well-worked fallow.
- (b) Seed in the autumn without a "nurse" crop of any kind.
- (c) Use from 10lbs. to 20lbs. seed per acre.
- (d) Drill in 2cwt. superphosphate per acre before seeding.
- (e) Broadcast the seed after drilling in the superphosphate, and roll to cover the seed.

- (f) Each time that the crop is grazed, it should be fed down rapidly. This can only be done by having the crops in very small fields.
  - (g) Every winter the lucerne fields should be thoroughly cultivated.
  - (h) An annual application of at least 1cwt. superphosphate per acre should be drilled in, in the winter.
- 



# Cletrac

**TANK-TYPE TRACTOR**

## GOES "OVER THE TOP"



**The ONLY TRACTOR that rides on top  
of the ploughed ground. 800 inches of  
track surface. Does not "pack" the  
soil. Runs on Kerosene.**

ENQUIRIES INVITED BY  
**CHARLES ATKINS & Co., Limited,**  
CURRIE STREET, ADELAIDE.

## THE AGRICULTURAL OUTLOOK.

## REPORTS FOR THE MONTH OF APRIL.

The following reports on the general Agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective Managers:—

*Booborowie.*—Weather—The weather for the month was almost all that could be desired. There was just sufficient rain at intervals to bring up the feed nicely, and also allow farmers to plough stubble land. We have registered 161 points of rain up to the time of writing. Crops—Any crops sown for green feed are up nicely. Natural feed is plentiful, and the young green feed is growing nicely amongst the dry grass. Stock, generally speaking, are in good condition for this period of the year. Pests—Rabbits are fairly numerous in places, but, on the whole, are not so plentiful as they usually are. Miscellaneous—Farmers are now seeding in earnest since the recent rains, and should be quite general by the first week in May.

*Eyre Peninsula.*—Weather—Rainfall for month, 23 points, over three days. First of month weather was quite summerlike, but rough, very thundery, and misty towards latter part of month. Crops—None showing up yet. Have drilled in about 160 acres of oats and wheat. It is going in splendidly, and we have a good clear run now, having nearly all the land ready for the drill. Natural feed has not yet moved after the fires. Stock all in very fair condition and free from disease. Pests—Rabbits have been severely poisoned and thinned out considerably. Miscellaneous—Most of the farmers have made an early start seeding, and are well on with their work, but are being considerably handicapped owing to having to cart water.

*Kybyholite.*—Weather for the month has been quite typical for April, and rainfall recorded, 130 points, equals the average for the past 15 years. Crops—As only 2in. rain have as yet been received for the year most of the land, excepting stubbles, is too hard for ploughing. However, fallows and stubbles have been worked, and a start made with cereal seeding. Green feed sown early in the month has germinated well, and made a good start. Most varieties of maize for grain are ripening well. Natural feed has started well, and rains have come timely to keep it going. Stock have done well on the oat stubbles, where caterpillars did so much damage last spring.

*Turretfield.*—Weather—This month has been dry, the rain that fell, 77 points, being distributed in showers which soon dried out, and were of no use. Crops—No crops have been sown in the immediate neighbourhood. Farmers are waiting for a good rain before commencing seeding operations. Natural Feed—There is no natural feed, and the stubbles are eaten out; stock have to be fed. Stock—A few lambs are being dropped. Dairy cows are badly in need of green fodder. Pests—Rats are becoming very numerous. Miscellaneous—Fallows are being worked and put in order ready for sowing.

## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on May 1st, 1922:—

**BUTTER.**—During the month of April local supplies cut off considerably, and heavy quantities of imported butter have been coming along from Victoria and New South Wales to meet trade requirements. As the last two States mentioned are running short of supplies also, we are now looking to Queensland for our extra wants. The London market has firmed considerably, and is likely to be short of butters during flush season owing to the absence of quantities coming from Siberia and France, so that prospects look very good for the opening of our season, London being likely to be a buyer at remunerative rates. Values firmed locally to the extent of 4½d. per lb. on top grades during the month. At close of period first grade to choicest factory and creamery fresh butter in bulk sold from 1s. 9d. to 1s. 9½d.; best private separators and dairies, 1s. 7d. to 1s. 8½d.; fair quality, 1s. 4d. to 1s. 6d.; store and collectors', 1s. to 1s. 2d.

**EGGS.**—Supplies have kept up remarkably well for the time of the year, and values throughout the month were steady, but the first snap of cold weather is sure to cause a heavy shrinkage, and prices are likely to rule much higher. At close of month rates improved 1d., fresh hen selling at 1s. 9d.; duck, 1s. 10d. per dozen.

**CHEESE.**—Values have improved in sympathy with higher prices ruling for butters, an improvement of 2d. per lb. being recorded. Export buyers are operating freely; there is also a good local trade passing, and at end of month range in price was 9d. to 10d. per lb. for large to loaf.

**HONEY.**—There is no alteration to report in values in this line. Good quantities have been coming forward, but export and local buyers have kept market cleared of prime samples, which realised 3½d. to 4d. per lb. Second grades, however, continue slow of sale at 2d. to 2½d. Beeswax is in good request at 1s. 8d. to 1s. 9d. for clear samples.

**ALMONDS.**—The crop has evidently been a good one by the quantities that have come forward. Export buyers have been keen in their operations, and nice clearances have been effected. At end of month Brandis sold at 12½d. to 13d.; mixed softshells, 11½d. to 12d.; hardshells, 5½d. to 6d.; kernels, 2s. to 2s. 1d.

**BACON.**—Rates throughout month have been stationary. Heavy quantities have been placed, but market was kept fairly clear. Best factory cured sides selling at 11d. to 1s.; middles, 1s. 1d. to 1s. 2d.; hams, 1s. 2d. Lard in packets, 8d.; bulk, 7½d.

**LIVE POULTRY.**—Very heavy quantities came forward for our Easter sales, but demand readily cleared all offering. At the Easter auctions values were a shade lower, but since then have recovered. There is a good demand at new rates, and farmers would be wise in sending in their surplus birds. Crates obtainable on application. Prime roosters, 4s. 6d. to 6s. 3d. each; nice-conditioned cockerels, 3s. 3d. to 4s. 5d. each; prime hens, 4s. to 6s. each; medium hens, 3s. to 3s. 9d. (couple pens weedy sorts lower); ducks, prime quality, 4s. to 6s.; fair quality, 3s. to 3s. 11d.; geese, 4s. 6d. to 5s. 6d.; turkeys, prime-conditioned, 1s. to 1s. 6d. per lb. live weight; fair-conditioned, 9d. to 11½d. per lb.; fattening sorts lower. Pigeons, 5d.

**POTATOES.**—There is not much alteration to report. Supplies are keeping up well, and a good turnover has been experienced throughout the month. Values are on a parity with those quoted last. With the good rains just experienced prospects of a heavy marketing from Victoria are bright. At end of month Millicent Redskins and Snowflakes sold at £3 17s. 6d. to £4 per ton on trucks, Mile End; Victorian Carniens at £7 10s. to £8 per ton, Mile End.

**ONIONS.**—These have an easing tendency owing to heavier quantities offering. Quotations at end of month were from 7s. 6d. to 8s. per cwt. on trucks, Mile End. Truck lots, 6s. to 7s. cwt.

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of April 1922, also the average precipitation to the end of April, and the average annual rainfall.

Station.	For April, 1922.	To end April, 1922.	Average to end April, 1922.	Average Annual Rainfall	Station.	For April, 1922.	To end April, 1922.	Average to end April, 1922.	Average Annual Rainfall
FAR NORTH AND UPPER NORTH.					LOWER NORTH—continued.				
Oodnadatta.....	1.26	2.63	2.08	4.83	Spalding.....	1.29	2.93	3.18	20.33
Marree.....	0.39	1.31	1.92	6.10	Gulnare.....	1.11	2.79	3.02	19.23
Farina.....	1.48	1.61	2.24	6.73	Yacka.....	0.88	2.14	2.95	15.34
Copley.....	0.52	1.26	2.55	8.45	Koolunga.....	1.25	2.46	3.01	15.79
Belkara.....	1.24	2.01	2.78	9.01	Snowtown.....	0.96	2.26	3.30	15.95
Blinman.....	1.26	2.37	3.46	12.62	Brinkworth.....	0.70	1.63	2.77	16.16
Tarcoola.....	0.44	0.96	1.32	7.59	Blyth.....	1.15	2.40	3.41	16.75
Hookina.....	0.36	1.02	2.74	13.30	Clare.....	2.04	4.14	4.69	24.51
Hawker.....	0.33	0.95	2.70	12.72	Mintaro.....	2.16	4.22	3.85	23.26
Wilson.....	0.60	1.33	2.76	12.33	Watervale.....	2.45	5.31	5.16	27.41
Gordon.....	0.73	1.39	2.67	11.05	Auburn.....	2.26	4.88	4.84	24.25
Quorn.....	0.85	1.54	2.89	14.00	Hoyleton.....	1.18	2.89	3.71	17.79
Port Augusta.....	0.80	1.60	2.59	9.54	Balaklava.....	0.78	1.87	3.52	15.87
Port Augusta West	0.78	1.41	2.33	9.53	Port Wakefield...	0.75	1.84	3.39	13.19
Bruce.....	1.07	1.64	2.42	10.40	Terowie.....	1.33	3.54	3.16	13.67
Hammond.....	1.12	1.77	2.93	11.61	Yarowie.....	1.92	4.72	3.25	14.06
Wilmington.....	2.51	3.38	3.73	18.17	Hallett.....	1.16	2.56	3.18	16.37
Willowie.....	1.65	2.13	2.71	12.16	Mount Bryan.....	1.70	2.90	2.90	16.54
Melrose.....	2.83	4.27	4.89	23.21	Burra.....	2.19	3.42	3.57	17.96
Booleroo Centre...	1.30	2.13	3.32	15.53	Farrell's Flat.....	1.71	2.72	3.66	18.90
Port Germein.....	0.75	1.62	3.01	12.79					
Wirrabara.....	0.81	1.60	3.87	19.62	WEST OF MURRAY RANGE.				
Appila.....	0.79	1.53	4.46	14.98	Manoora.....	1.66	3.08	3.44	18.63
Craddock.....	0.26	0.89	2.65	11.18	Saddleworth.....	1.96	3.79	4.14	19.70
Carrieton.....	0.74	1.65	2.81	12.63	Marrabel.....	2.56	4.24	3.64	19.55
Johnburg.....	0.78	1.44	2.33	10.50	Riverton.....	2.53	4.16	4.27	20.66
Eurelia.....	0.82	1.73	2.88	13.36	Tarlee.....	1.39	2.63	3.83	17.75
Orroroo.....	1.42	2.49	3.33	13.57	Stockport.....	1.14	2.48	3.47	16.34
Nackara.....	0.71	1.98	3.00	11.33	Hamley Bridge.....	1.27	2.85	3.62	16.45
Black Rock.....	1.20	2.00	3.01	12.51	Kapunda.....	1.39	2.89	4.23	19.80
Uoolta.....	0.97	1.71	2.72	11.90	Freeling.....	1.09	2.64	3.81	17.82
Peterborough.....	1.49	2.31	4.55	13.43	Greenock.....	1.17	3.08	4.22	21.56
Yongala.....	1.76	1.61	3.15	14.41	Truro.....	1.60	2.96	4.03	20.07
					Stockwell.....	1.76	3.17	4.08	20.24
LOWER NORTH-EAST.					Nuriootpa.....	1.19	3.19	4.09	20.94
Yunta.....	0.23	0.76	2.54	8.75	Angaston.....	1.48	3.95	4.30	22.44
Waukaranga.....	0.10	0.39	2.26	8.41	Tanunda.....	1.58	4.06	4.45	22.17
Mannahill.....	0.10	0.74	2.51	8.54	Lyndoch.....	1.15	3.23	4.16	22.81
Cockburn.....	0.45	1.29	3.38	8.22	Williamstown.....	0.84	3.15	4.82	27.52
Broken Hill, N.S.W.	1.20	2.07	—	9.91					
LOWER NORTH.					ADELAIDE PLAINS.				
Port Pirie.....	0.87	1.44	3.14	13.36	Mallala.....	1.03	2.34	3.58	16.58
Port Broughton...	0.99	1.81	3.04	14.18	Roseworthy.....	0.90	2.29	3.69	17.27
Bute.....	1.03	2.24	3.09	15.65	Gawler.....	0.83	2.25	4.05	19.08
Laura.....	1.43	3.10	3.73	18.16	Two Wells.....	0.73	1.89	3.49	15.85
Caltowie.....	1.17	2.78	3.56	17.07	Virginia.....	0.54	2.08	3.69	17.32
Jamestown.....	2.08	3.48	3.49	17.74	Smithfield.....	0.36	1.49	3.36	17.15
Bundaleer W. Wks.	1.02	2.41	3.08	17.89	Salisbury.....	0.74	2.64	3.99	18.49
Gladstone.....	1.62	3.33	3.36	16.13	North Adelaide...	1.34	5.18	4.31	22.09
Crystal Brook.....	1.00	2.78	3.31	15.74	Adelaide.....	1.50	3.90	4.19	21.03
Georgetown.....	1.55	3.59	3.77	18.44	Glenelg.....	1.38	3.43	3.73	18.37
Narridy.....	0.61	1.63	3.39	16.41	Brighton.....	1.81	3.47	4.06	21.24
Redhill.....	1.62	2.64	3.32	16.75	Mitcham.....	2.59	6.29	4.48	23.92
					Glen Osmond.....	2.62	6.58	4.86	25.74
					Magill.....	1.70	4.96	4.90	25.27



## RAINFALL—continued.

Station.	For April, 1922.	To end April, 1922.	Av'ge. to end April, 1922.	Av'ge. Annual Rainfall	Station.	For April, 1922.	To end April, 1922.	Av'ge. to end April, 1922.	Av'ge. Annual Rainfall
<b>MOUNT LOFTY RANGES.</b>					<b>WEST OF SPENCER'S GULF—continued.</b>				
Teatree Gully .....	1-46	4-78	5-16	27-77	Port Lincoln .....	1-13	2-93	3-40	19-75
Stirling West .....	4-71	12-08	7-22	46-62	Tumby .....	0-67	1-56	2-47	14-62
Uraidla .....	4-10	11-14	7-73	44-06	Carrow .....	0-37	0-76	2-67	14-64
Clarendon .....	2-37	7-48	6-36	32-98	Arno Bay .....	0-39	1-37	2-78	13-08
Morphett Vale .....	1-73	4-04	4-62	22-76	Cowell .....	0-33	0-87	2-07	11-52
Noarlunga .....	1-15	2-61	4-04	20-27	Minnipa .....	0-44	1-54	—	—
Willunga .....	1-62	6-16	4-75	25-87					
Aldinga .....	1-51	4-74	3-91	20-24					
Myponga .....	1-78	4-76	4-39	28-44					
Normanville .....	1-17	3-89	3-87	20-51					
Yankalilla .....	1-54	5-25	4-37	22-99					
Mount Pleasant .....	1-79	5-30	4-83	27-04					
Birdwood .....	2-15	5-01	5-09	29-26					
Gumeracha .....	2-71	6-42	5-75	33-25					
Millbrook Reservoir .....	2-49	6-60	—	—					
Tweedvale .....	3-10	5-49	5-68	35-54					
Woodside .....	2-76	7-81	5-32	32-08					
Ambleside .....	3-53	9-27	5-83	34-62					
Nairne .....	2-34	5-69	5-38	28-43					
Mount Barker .....	3-17	8-38	5-61	31-13					
Echunga .....	2-65	7-19	6-02	32-91					
Macclesfield .....	1-93	5-90	5-64	30-53					
Meadows .....	2-59	8-05	6-65	36-04					
Strathalbyn .....	1-63	3-76	3-94	19-26					
<b>MURRAY FLATS AND VALLEY.</b>					<b>YORKE PENINSULA.</b>				
Meningie .....	2-27	3-58	3-68	18-66	Walleroo .....	1-02	1-59	3-14	14-09
Milang .....	1-54	3-03	3-39	15-42	Kadina .....	0-86	1-75	3-49	15-93
Langhorne's Bridge .....	1-33	3-07	3-21	14-55	Moonta .....	0-99	1-75	3-43	15-25
Wellington .....	1-41	2-47	3-37	14-68	Green's Plains .....	0-81	2-04	3-04	15-72
Tailem Bend .....	1-13	2-03	3-11	14-11	Maitland .....	1-31	3-69	3-84	20-05
Murray Bridge .....	0-92	1-62	3-35	13-83	Ardrossan .....	0-88	2-24	2-97	13-95
Callington .....	0-89	2-04	3-50	15-37	Port Victoria .....	1-18	2-54	3-05	15-35
Mannum .....	0-61	1-28	2-95	11-52	Curramulka .....	1-10	3-29	3-45	18-16
Palmer .....	0-67	1-70	3-03	15-24	Minlaton .....	0-97	3-51	3-33	17-79
Sedan .....	0-77	1-35	2-77	12-13	Brentwood .....	1-08	3-10	2-90	15-54
Swan Reach .....	0-81	1-25	2-45	10-82	Stansbury .....	0-83	3-51	3-27	16-96
Blanchetown .....	0-71	0-87	2-66	10-16	Warooka .....	1-55	3-77	3-03	17-69
Eudunda .....	2-71	3-48	3-53	17-50	Yorketown .....	1-42	3-03	3-11	17-22
Sutherlands .....	1-57	1-73	2-14	10-92	Edithburgh .....	1-71	3-60	3-21	16-53
Morgan .....	1-11	1-63	2-22	9-18					
Waikerie .....	0-93	1-33	2-28	9-68					
Overland Corner .....	1-55	1-81	2-87	11-08					
Loxton .....	0-98	2-08	3-01	12-58					
Renmark .....	1-83	2-69	2-63	11-02					
<b>WEST OF SPENCER'S GULF.</b>					<b>SOUTH AND SOUTH-EAST.</b>				
Eucla .....	2-30	3-34	3-17	10-02	Cape Borda .....	2-22	3-91	4-01	25-01
White Well .....	2-58	3-86	2-04	9-10	Kingscote .....	1-37	3-18	3-41	19-01
Fowler's Bay .....	1-53	2-38	2-25	12-19	Penneshaw .....	1-63	3-21	3-11	18-97
Penong .....	2-24	3-08	2-38	12-25	Victor Harbor .....	1-30	3-42	4-20	21-43
Ceduna .....	1-55	1-70	1-69	10-32	Port Elliot .....	1-28	3-06	4-03	20-00
Smoky Bay .....	1-61	2-27	1-68	10-92	Goolwa .....	1-27	2-42	3-75	17-83
Petina .....	1-61	2-84	1-89	13-05	Meribah .....	0-98	1-61	—	—
Streaky Bay .....	1-53	2-32	2-52	15-11	Mindarie .....	0-86	1-17	—	—
Talia .....	0-53	1-62	1-86	15-38	Karoonda .....	0-87	1-70	—	—
Port Elliot .....	1-26	2-20	2-46	16-53	Pinnaroo .....	0-68	1-26	3-31	15-32
Cummins .....	0-94	1-97	—	18-87	Parilla .....	0-84	1-92	2-57	14-39
					Lameroo .....	0-92	2-43	3-14	16-27
					Parrakie .....	1-12	2-01	2-47	14-27
					Geranium .....	1-72	2-45	2-91	15-96
					Peake .....	1-53	2-26	3-22	15-91
					Cooke's Plains .....	1-59	2-54	3-16	14-84
					Coomandook .....	1-68	2-66	3-11	17-31
					Coonalpyn .....	2-35	2-79	3-49	17-44
					Tintinara .....	1-43	2-16	3-48	18-54
					Keith .....	1-65	2-80	3-18	18-19
					Bordertown .....	1-12	2-19	3-85	19-44
					Wolsley .....	0-89	1-81	3-50	18-06
					Frances .....	0-80	2-77	—	19-78
					Naracoorte .....	1-86	3-07	4-29	22-46
					Penola .....	1-95	2-82	5-03	26-36
					Lucindale .....	1-91	3-24	4-12	22-91
					Kingston .....	1-84	4-29	4-30	24-44
					Robe .....	0-44	3-50	4-29	24-58
					Beachport .....	1-04	3-88	4-95	27-27
					Millicent .....	1-92	4-54	5-73	29-37
					Kalangadoo .....	2-20	4-06	—	—
					Mount Gambier .....	1-55	3-45	6-33	31-46

# AGRICULTURAL BUREAU REPORTS.

## INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings		Branch.	Report on Page	Dates of Meetings.	
		May.	June.			May.	June.
Alawoona .....	*	—	—	Eurelia .....	*	—	—
Aldinga .....	*	—	—	Frances .....	918	27	24
Amyton .....	*	—	—	Freeling .....	*	—	—
Angaston .....	*	—	—	Gawler River .....	892	15	12
Appila-Yarrowie .....	*	—	—	Georgetown .....	*	6	10
Arthurton .....	*	—	—	Geranium .....	912	27	24
Ashbourne .....	918	—	—	Gladstone .....	884	6	10
Balaklava .....	*	13	10	Glencoe .....	922	—	7
Balhannah .....	918	5	9	Glossop .....	912	—	—
Barmera .....	911	9	6	Goode .....	*	10	—
Beetaloo Valley .....	880	—	—	Green Patch .....	903	—	6
Belalie North .....	*	6	10	Gumeracha .....	*	—	12
Berri .....	*	10	7	Halidon .....	*	—	—
Big Swamp .....	*	—	—	Hartley .....	918	—	—
Blackheath .....	*	6	10	Hawker .....	*	9	13
Black Springs .....	*	9	6	Hilltown .....	*	—	—
Blackwood .....	*	15	19	Hookina .....	*	11	8
Block E .....	913	—	—	Inman Valley .....	*	—	—
Blyth .....	880	6	3	Ironbank .....	*	6	10
Booleroo Centre .....	*	5	9	Julia .....	*	—	—
Borrika .....	*	—	—	Kadina .....	*	—	—
Bowhill .....	*	—	—	Kalangadoo .....	922	13	10
Brentwood .....	892	11	8	Kangarilla .....	918	12	9
Brinkley .....	905	6	10	Kanmantoo .....	*	6	10
Bundaleer Springs ..	*	—	—	Keith .....	*	—	—
Burra .....	*	—	—	Ki Ki .....	*	—	—
Bute .....	*	9	6	Kilkerran .....	894	11	8
Butler .....	†	8	12	Kimba .....	*	—	—
Cadell .....	*	—	—	Kingseote .....	*	—	—
Caltowie .....	*	—	—	Kingston-on-Murray.	†	—	—
Canowie Belt .....	*	—	—	Kongorong .....	*	11	8
Carrow .....	*	4	8	Koonibba .....	*	11	8
Cherry Gardens .....	913	9	6	Koppio .....	903	—	5
Clanfield .....	911	—	—	Kybybolite .....	919	11	8
Clare .....	885, 892	5	9	Lake Wangary .....	903	6	10
Clarendon .....	*	8	5	Lameroo .....	907	12	9
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\* No report received during the month of March.

† Held over until next month.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

MORCHARD (Average annual rainfall, 13.50in.).

April 8th.—Present: 14 members and one visitor.

IMPROVEMENT OF FARM STOCK.—The Chairman (Mr. F. Scriven) read the following paper:—"In every branch of agriculture the man on the land should aim at producing a product of the highest standard. Many farmers are very particular in some matters—selection of seed, &c., but in other matters, more particularly farm stock, they are grossly negligent, and, in consequence, animals of a very inferior quality are a part of the farm's products. Stock breeding and the quality of the stock are matters of great importance to every man on the land. My contention is that a man who is careless in this respect is, in most cases, worse off financially, and often finds himself in difficulty. In most cases mixed farmers are interested in horses, cattle, and sheep. In the case of a farmer who is not firmly established, his horses may not be up to what they should be; but by breeding, say, two foals each year from his best mares, and the very best draught stallion in the district, in a few years his team would be one of which he would be proud. With regard to cattle, the average farmer has space for improvement in this direction, an industry that shows a very marked degree of indifference. Should a farmer have a fancy for breeding beef, which, in my opinion, is not a paying proposition in this district, he should breed from a sire noted for beef qualities. On the other hand, if breeding for a dual purpose, milk and beef, he should select a bull which is of pure breed and noted for the qualities mentioned. And last, but not least, an animal of great importance is the sheep. Any class of animal will do to eat up surplus feed and clear up weeds, but from a financial point of view a well-bred Merino is the best sheep for this district. If rams are purchased from a well-known stud the class of sheep will undoubtedly improve, and in a few years reach a standard of efficiency which should be the ambition of every up-to-date farmer."

WILLOWIE (Average annual rainfall, 11.90in.).

April 7th.—Present: six members and visitor.

TREE PLANTING ON THE FARM.—Mr. W. B. Bull, who contributed a paper dealing with this subject, said to make the planting of either fruit or timber trees a successful undertaking on the farm, perseverance and a desire to improve the appearance of the property were most essential. Many farmers planted trees with the best intentions of caring and tending to the trees, but it frequently happened that during a hot spell of weather water became too precious to give to the trees, and consequently they died. He deplored the destruction of timber that was taking place in practically every State of the Commonwealth, and thought that some steps should be taken to give an impetus to the great question of afforestation. The great drawback to the planting of timber trees on private holdings was the fact that the trees took so many years before they reached a marketable age. It was not everyone who could plant land with trees and then wait 15 years

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before any revenue was received from the undertaking. Notwithstanding those statements, trees beautified and added to the value of a property, and every farmer should plant a few trees on his property. Mr. A. Hughes then read a paper, "The Mistake of Overstocking." Interesting discussions followed the reading of both papers.

ORROROO, March 11th.—Mr. W. Toop gave a report of the March Show and the farewell dinner tendered to His Excellency the Governor. Mr. Zanker reported that starlings had become a great nuisance in the district, and that he had destroyed a number with the aid of poisoned fruit. Mr. Graham mentioned that he had successfully poisoned starlings with pieces of finely-chopped poisoned meat placed in tins.

TARCOWIE, April 11th.—Mr. C. A. Kotz gave an interesting account of a recent trip he had paid to the guano deposits in the northern districts of the State. A number of samples taken from the deposits by Mr. Kotz were exhibited at the meeting, when a most profitable discussion followed.

## MIDDLE-NORTH DISTRICT

(PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 23.50in.).

April 10th.—Present: 16 members and visitors.

WATER CONSERVATION.—"The first point to bear in mind when dealing with this important question is to see that the site for the water supply is selected from as near the homestead as possible," said Mr. M. J. Casey, in a paper dealing with the above subject. Continuing, he said a good watercourse was to be preferred, because the amount of silt from the roads and cultivated land would be reduced to a minimum. The next step was to see that the chosen site was good holding ground, and that could only be ascertained by putting down a number of trial holes, and filling them with water. For excavating, he suggested the plough scoop, but before work was commenced on the main dam a small catchment should be made a short distance from the intake, with the idea of preventing the silt from going into the main catchment. He favored a long and narrow dam, because with a wide dam a good deal of water was lost through evaporation. If finances permitted, the dam should be fenced, and a windmill and tank erected. Members agreed with most of the points expressed in the paper, but it was generally contended that it was advisable to allow sheep to water at the dam for a year or two in order to puddle the banks.

BLYTH (Average annual rainfall, 16.46in.).

March 4th.—Present: 19 members and nine visitors.

BEST CLASS OF HORSE FOR FARM WORK.—Mr. H. W. Bime contributed a paper on this subject. The work of a horse, he said, depended a great deal on the treatment it received. He did not think a farmer could be too careful in selecting a driver for his team. There were many different types of horses used on the farms to-day, ranging from heavy draughts to mediums and light spring dray horses, each class taking its respective place on the farm. He favored the three-quarter draught or a horse bred from an ordinary draught mare by a Clydesdale stallion. That cross, he stated, would produce a horse with a good top, little hair, and would be the most useful horse for all kinds of farm work. He preferred the Clydesdale cross to the Shire, because the former was more active and compact, and did not show so much hair as the Shire. Hair and plenty of condition were all right in the show ring, but to a farmer who had to make his living by his horses, large, bulky animals with a lot of hair were of no use. Very often a farmer had to work his team day after day in wet weather on ploughed ground, and that was his reason for recommending a type of horse with less hair in preference to a hairy horse. A farmer when breeding should choose the best mares he

had, and cross them with the purest Clydesdale procurable. Care should be taken not to breed too light a class of horse, because it was very often difficult to dispose of them to the best advantage. It should be every farmer's ambition to try and keep the type of horse he fancied, and to have all the horses of the same size or stamp, for not only would they have a much better appearance than an uneven team, but they would also work more evenly. It was also advisable to keep two or three spare horses for use in the team during the winter months. The present methods of farming demanded a fast-walking animal, and the only place where a heavy team was necessary was in the wheat wagon, and as it did not pay to keep a team for that class of work alone, he would recommend the three-quarter draught horse as the most suitable animal at the present time. A good discussion followed the reading of the paper. Mr. Burgess favored a heavier type, and believed in caring for both the mare and foal from the birth of the foal as an essential to breeding good stock.

**BEST WHEAT FOR HAY.**—In replying to this question, Mr. C. Hutton said:—"This district, being a grain-producing one, our considerations are to find wheats that produce maximum yields of marketable grain suited to the locality. Most hay in this district is cut for the purpose of feeding to stock, and, generally speaking, by the time a farmer has cut headlands and roadways, he requires but very little more. The little more that is required will be cut from a crop that does not promise to yield too well, or from a variety of wheat most suited for the purpose, that is an early variety which yields a heavy straw, not flaggy, and of good color. These points should be more especially noted when a farmer is growing hay and chaff for the market. It is a good idea for a farmer to sow portion of his stubble land with a suitable variety of oats, and cut it as a portion of his hay. The oat crop makes good hay, and is cheaply grown. In regard to the best variety of wheat to grow in this district for hay, I should say that King's Early is the most popular, being also a good grain yielder. Other good varieties are King's Red, King's White, Early Gluyas, and Bluey. I also think that Early Crossbred 53, Caliph, and Huguenot may be grown in this district for hay with advantage. Huguenot should do well on the plains for hay, but being a Macaroni type, it cannot be recommended for grain."

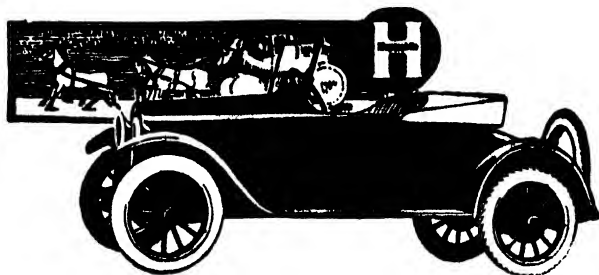
#### LAURA. April 8th.

**PREPARATION OF FALLOW AND THE BEST WHEATS FOR THE DISTRICT.**—Mr. H. R. Limes read the following paper on this subject:—"In the first place the farmer should endeavor to have his fallow land free from summer weeds. If this is carried out, the harrows can be run over the fallow whenever rain falls before seeding is commenced. This will make the land fine on the surface, and will give the weeds a better chance to come up when rain falls towards seeding. I have found rolling dark fallow land in April a good practice, as all weeds, &c., in the clods are pressed into the soil, and will shoot more quickly than when exposed to the air. With regard to the best varieties of wheat to sow, one cannot lay down any hard and fast rule, because soils in this district are so varied. I consider that four varieties of wheat are sufficient for any ordinary farmer to sow, the choice of which he can by careful study determine. Without a doubt, taken all round for wheat, Federation has done more than any other kind in filling the pockets of the farmers in this district. It is a wheat that will do well on the poorer class of soil with an average rainfall. For heavy soil I would sow a fair amount of German Wonder. This is a good variety to stool, can be sown early, and in dry weather, if need be, it grows well, and is a good wheat for hay. For a mid-season wheat Carawa does very well, and nearly any year will return an average crop, but it is a very poor wheat for hay. For late sowing, Gluyas, Florence, and the King's varieties give excellent results, especially for hay. Any of the above-mentioned wheats should all be sown fairly thickly, from 60lbs. to 80lbs. per acre. I believe thick sowing of wheat and super has a tendency of choking out the weeds, thus giving a better growth of grain. In selecting seed one ought to obtain the best grain possible. I believe that the same peculiarities predominate in plant as well as in animal life. To breed from weedy and impure stock spells ruin, therefore, for best results in growing wheat or any other grain, secure the best possible seed."

better supply of milk than the purebred ones. In selecting a young sow for breeding she should have a good length of body, a long neck, not less than 12 teats, well spaced and developed. Such a sow will, as a rule, have a big litter and plenty of milk to nourish them with. I recommend the Berkshire for grazing, as having had anything up to a couple of hundred pigs at a time of various breeds under these conditions they have proved less subject to sun scald and are in every way hardier than the Yorkshire. With regard to the financial side of pig raising, one has only to consider that a good sow should rear an average of eight pigs at a litter, twice a year, and that these young pigs should be fit for market in from six months to nine months to realise the profits that can be made from them if reared under the best conditions." During the discussion, Mr. Hamlyn said that dairying and pig raising were inseparable, as pigs greatly benefited by the use of skim milk from the dairy. Mr. Lewcock remarked that when pig raising on a large scale was being undertaken the fodder was grown for the pigs, and then the pigs were turned in and allowed to harvest the crops.

**THE YOUNG VINEYARD.**—At a further meeting, held on March 10th, Mr. L. Dux contributed a paper on the above subject. He said the land selected for the vineyard should be well fallowed the year before planting, and if one so desired it could be made to carry a crop of wheat or some other cereal. He favored having a crop on the land during the summer, and recommended the use of not less than 1cwt. of super to the acre, and it would be noticed that the young vines would receive considerable benefit from the heavy dressing of super during their first year's growth. The stubble should be burnt off early in the season, so that the land could be ploughed to a depth of about 5in. immediately after the first rains, then harrowed, and worked with a light roller. For the planting operations a roll of light galvanized wire should be obtained, and knots made at whatever distances apart it was intended to plant the vines. The wire was then used for pegging out the land. He did not advise placing sight sticks right across the plot, as there was a danger of them being moved or blown out of position by the wind. For striking out, a good two-wheeled single-furrow plough, two staunch horses, and an extra wide two-horse swing were needed. Next, the first row of pegs should be removed, and replaced with sight sticks. A man leading the two horses, by holding them close to the bit, and walking in a straight line with the sight sticks, would considerably simplify the making of straight furrows. On arrival at the first stick the team should be stopped, the stick removed, and then placed in exactly the same spot as the second stick. That procedure should be adopted until the end of the row was reached. It was advisable to come back in the same furrow, and do all the striking out one way. A long coupling for the horses would be required to enable them to walk one on either side of the furrow. The next work was that of subsoiling, and if a subsoiler could not be obtained, the work could be performed with a large single-furrow plough, from which the mould board had been removed. The plough should be let into the soil down to the beam. The wire was then again brought into use, and after the first row had been laid out with the aid of the measure sticks, very little work should have to be done with the shovel. The young vines should be ploughed back so soon as possible to keep the water from standing in the furrows. Once the young vines commenced to shoot they should be worked after every rain if possible, and hand-hoed two or three times during the spring. The same amount of cultivation should be given the vine the second and third years. For trellising, he preferred the single wire, 4ft. 6in. posts, and 6ft. strainers, which meant a 3ft. trellis. According to his experiences the wire should be put on top of the posts, and fixed down through the hole in the post with a short piece of soft wire. By using a wire key the soft wire could be fixed so tightly around the main wire that it would prevent it from slipping in case of a wire breaking. By fixing the wire in that manner each post took the weight of its own panel of vines. It would be found that the trellis was far stronger, and when the crop was at its heaviest there would be no broken wires or strainers pulling out of the soil. In the discussion that followed, Mr. Butler said the subsoiling advised in the paper was not general in their district, but it would be of benefit in some classes of land. The use of the plough for striking out furrows did away with the digging of holes, and helped to drain off the water. The drainage with furrow would be of utmost value on hillsides. Mr. Hague said that he did not favor having a wheat crop off the land before





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planting, but preferred to let the land lie out in fallow. Mr. Victorsen, in speaking upon the cultivation of the vineyard, said that he favored thorough cultivation, as it helped to firmly establish the young plants. Mr. F. J. Knappstien did not favor the furrow system of planting the vines. The rolled ground would help to throw the water into the furrow, and the water then got down into the subsoiled portion, thereby becoming stagnant, and, in addition, the soil would set too hard around the roots. The lines must be sighted on sloping ground. The trellising was not favored, as it did not allow of straining up in case of broken wire. Mr. Lawrence did not think that subsoiling was always advisable, and thought the furrow system was not suitable for drainage, as the water would accumulate too close to the roots. He favored the use of the wire for planting, digging the holes at the points on the line.

#### OWEN.

January 27th.—Present: 20 members and six visitors.

**HARVEST RESULTS.**—Mr. A. N. Freebairn, who read a lengthy and exhaustive paper dealing with this subject, said that in the majority of the wheatgrowing areas of South Australia, the harvest for the past season had been a disappointment. It was the general opinion that the cause of the practically low yields of wheat was the very hot spell of weather that was experienced during the middle of November, yet an inspection of many fields showed that the heads of the wheat plants contained but few grains. Another point that, in his opinion, mitigated the yield was the adoption of summer working of the fallow. One surprising feature of the season was the fact that larger areas had not been cut for hay; but that could possibly be accounted for by the comparatively low prices ruling for the product, and the scarcity and dearness of labor. Referring to the behaviour of certain varieties of wheat in Owen and the surrounding districts, the speaker said Gluyas returned between seven and eight bags to the acre; but some difficulty was experienced in the reaping, because the straw broke off at the first joint. Ford yielded about the same average as the former variety, the grain was good, but the general tendency of the plants was towards a rank growth. Major did very well on the heavier types of land, and some farmers reaped seven bags to the acre of that variety. Federation was not grown to any extent, but some good crops were harvested. Crossbred 53 filled out fairly well, and farmers who had sown it expressed themselves in terms of satisfaction. Marshall's No. 3, sown on properties at the foot of the hills, suffered very severely from the hot winds. The early grain sown before rain yielded from five bags to seven bags to the acre, while that drilled in later on in the season only went from 9bush. to 12bush. King's Red and King's White had a large number of supporters in the Owen districts, but during the past season the crops received a very serious setback. The wheat was very rusty, yet Marshall's—a crop that was considered more susceptible to the disease—was practically free from the disease. Three or four bags to the acre was about the average yield of both the King's varieties. An interesting discussion followed. Mr. T. Freebairn was of the opinion that summer cultivation spoilt the seed bed. Mr. R. S. Harkness thought that summer fallowing after rain, followed by a light cultivation, would prove beneficial to the crops. Mr. W. Marshman also spoke.

#### ROSEDALE.

March 15th.—Present: 10 members.

**HAYMAKING.**—Mr. H. Nettlebeck contributed a paper on this subject. The best time to bind the crop that was intended for hay, he said, was about 10 days after it had reached the flowering stage. Much depended on the weather conditions. Last season the crops went off very quickly, and had to be cut early to procure a good color. The varieties he preferred were King's Early, Florence, and Crossbred 53, because they were fine in the straw and had good feeding qualities. The sheaves should be stooked, if possible, after they had lain in the paddock for half a day. He preferred round stooks with about 40 sheaves, and made with a good slope, to prevent the wind from blowing them about. Carting should be commenced as early as possible after the stooks had been standing for a fortnight, providing the weather was favorable. Hay carted early came out of the stack in better

condition than hay carted late in the year. The hay should be stacked in a convenient position, preferably on a foundation of straw or timber to prevent the bottom sheaves of the stack from becoming mouldy. He preferred stacking with the heads and butts out alternately, in order to make the stack settle down firmly. Care should be taken in roofing the stack, and the centre should be at least 4ft. higher than the outside before commencing the eaves. Clean and straight hay should be used for roofing to make a good slope to carry off the water. Straight straw was necessary for thatching, and to obtain that the straw should be dragged one way in the paddock and then rolled in the opposite direction. The stack should be allowed to settle before thatching, and every advantage taken of the damp weather. When cutting chaff, care should be taken that the knives were sharp and set close to the mouth of the cutter. If the hay was damped before cutting it would give the chaff a sweet smell. Chaff should be cut at least once a week, so that the horses would always have fresh feed. The horses should not be given too much feed at once, but the evening meal could be a little larger than the others. When keeping hay in reserve it was a payable proposition to erect a mouse-proof staging. One method was to take the tops out of kerosine tins and put them over the posts, and then build the platform. Another method was to fence the stack in with 3ft. 6in. plain galvanized iron, placing the iron 6in. in the ground and nailing a piece of tin on the top of each post where the iron was joined. That should be carried out before commencing to build the stack. The stack could be built about 1ft. inside of the iron, and the eaves could then be allowed to project over the iron. Such a plan would also keep the water away from the bottom of the stack. The cost of fencing a stack 100ft. x 20ft. would be approximately £11, but he thought it would pay, especially when mice were numerous, and if it was intended to keep hay for two or three years. If a 100-ton stack was kept for two years without being mouse proof 10 tons at least would be lost, which at £3 per ton would be equivalent to a loss of £30.

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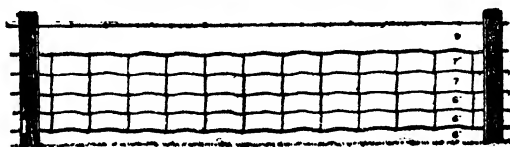


Fig. 7.—5-line Special Cyclone Spring Coil Fence.

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## TARLEE.

April 11th.

SEEDING OPERATIONS.—In the course of a paper dealing with this subject, Mr. L. Molineaux said the first point to give consideration to in the work of preparing for seeding was the destruction of summer weeds. If stinkwort had a strong hold of the fallow, the cultivator should be brought into use after the first rain, and the harrows employed after every downpour. All the implements should be thoroughly examined and any repairs effected before the time arrived to commence the work. The new implement, combined drill and spring-toothed cultivator, was a good machine for early work, but after the weeds had made a strong growth it was necessary to fall back on the ordinary implement. He did not favor harrowing after the drill, unless the soil was in a free, crumbly condition. Where there was a sufficient number of hands, the speaker favored pickling the grain on the floor, with a solution made from 1½lbs. of bluestone and 8galls. of water to every eight bags of wheat. Mr. M. Nash also contributed a paper on the above subject, in which he stated that the fallowing of land intended for cereal crops should be commenced during July or August and completed not later than the first week in September. The black land in their district should not be worked to a greater depth than 3in., but he thought the red soil could be safely ploughed to 4in. or 5in. The sod should be well turned and left exposed to the weather as long as possible before it was broken down. The fallow could be cultivated in September and October. The black land could be sufficiently cultivated with heavy harrows, but red soil required the cultivators, and should be left a little on the rough side. If made too fine the top surface formed into a hard crust, and allowed any rain that fell in summer or early autumn to escape into the lower patches. Heavy harrows would kill all weeds on black ground, and were better than the cultivator, because the harrowing left the bottom soil tightly packed, with a loose surface, which retained the moisture. If rain should fall after harvest the harrows should again be used to encourage the growth of weeds. These could be kept in check by feeding off with sheep, and would be more easily dealt with at seeding time. All seed should be well cleaned and ready for the drill about the middle of April. The implements and harness should be in good order and the super well under cover. May was the best month to sow wheat or hay crops; barley and oats could be put in late in June or early in July. All grain for seed should be pickled at least 36 hours before putting through the drill. He favored pickling the wheat in the bag in a tub or cask, with a solution of 30galls. of water and 2lbs. each of bluestone and salt. The quantity of seed per acre depended on the variety sown. King's (White and Red), Gluyas, and other early upright wheats required about 75lbs. to the acre for grain and about 90lbs. for hay crops. For the later varieties, such as Major, Yandilla King, Bluey, and other slow growers and good stooling sorts, a bushel per acre should be put through the drill. The super should be drilled in at the rate of 120lbs. for hay and 90lbs. to the acre for grain crops. The seed should not be drilled in more than 1½in. deep, and light harrows should be used after the drill to cover any exposed grain. When the crop was well over the ground, heavy rollers should be run over the black land. Red land did not require rolling except to make it smooth for the harvesting implements. In the discussion that followed Mr. D. L. Clarke said experience was the best guide in knowing when to start seeding operations, but as a general rule he thought a start should not be made until after a good rain, especially if the land was dirty. He stressed the importance of a firm seed bed. Mr. T. Hooking agreed that it was best to wait for a good rain before commencing seeding, and if the fallow was dirty, early varieties of wheat should be sown. Mr. W. Edgerly favored the practice of harrowing behind the drill. Mr. Hooking said 1lb. of bluestone to 15galls. of water was sufficient for pickling, but if the seed was smutty, he would use 1lb. to 10galls. of water. Mr. G. H. Willis was a strong advocate for formalin pickling, and said it did not affect germination. He cited an instance of leaving a bag of wheat that had been treated with formalin stand over from the previous seeding. The grain had been sown the next year, and it grew as good as what had been drilled in 24 hours after treatment.

## WILLIAMSTOWN.

April 7th.—Present: 28 members.

**FRUIT DRYING FOR THE HOUSEHOLD.**—The Hon. Secretary (Mr. George Brown), in the course of a paper on this subject, said the varieties of fruit for drying that did best in their locality were the prune d'Agen, Splendour, Robe d'Sergeant, Sugar, Felleberg, Tragedy, Angelina Burdett. Of the light varieties Coe's Golden Drop and Reine Claude de Bavay were recommended. It did not pay to dry such kinds as the Washington Egg Plum, Diamond, and Pond's Seedling, as it was more profitable to market them as fresh fruit, especially if prices were at all reasonable. The picking of the fruits was of the utmost importance, as unripe fruit would not dry properly, and produced an inferior article. The sulphuring process of the light varieties of plums, pears, peaches, apricots, nectarines, &c., was very simple when one became accustomed to it. The sulphur house could be built of lime concrete, because it was permanent, and did not deteriorate to the extent as did the sulphur boxes through constant handling. A good dip could be made of 1lb. of caustic soda to about 10galls. to 12galls. of water. The time of dipping required a certain amount of judgment, as such varieties as Tragedy (6secs.), and the prunes d'Agen, Splendour, and Robe d'Sergeant (10secs.). Angelina Burdett, which had a very tough skin, required at least 60secs. An economical tray could be made from petrol cases, of about 3ft. 6in. to 4ft. in length; one man could then handle them with ease. The cutting of the apricot and peach required a keen-edged knife, and if cut around the sutural margin, a flick of the hand or the insertion of the point of a small finger would remove the stone. If good weather conditions prevailed the fruit could be dried in three or four days. The fruit did not dry all together, but required constant attention and proper selection. The speaker tabled 12 varieties of dried fruits, sulphured and unsulphured, and extended to members an invitation to inspect his sulphur house. A good discussion resulted, and several questions were asked and answered.

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**CLARE, April 7th.**—The meeting took the form of an exhibit night, when members tabled samples of dried fruits, each member explaining the process that had been adopted in raising and drying the fruit.

**GAWLER RIVER, April 10th.**—An interesting article, "Gypsum," was read by Mr. Odgers, and a lengthy discussion followed. A report was received from the Hon. Secretary (Mr. T. M. Rice) stating that red scale was spreading among the gardens in the district. It was decided to ask the Department to take steps to have the trees fumigated.

**LYNDOK, April 6th.**—The closing of the Government Experimental Farm at Turretfield as a seed-wheat farm formed the subject for the evening. An interesting discussion followed. It was decided to visit the Rosedale Branch on August 9th.

**NANTAWARRA, March 9th.**—Mr. G. Herbert read a paper, "Horses." The speaker dealt mainly with the Percheron breed, and gave a very interesting description of the origin and growth of the breed.

**OWEN, March 24th.**—Messrs. Henshaw Jackson, W. N. Twiss, W. D. Henderson, and J. McLachlan, M.P., attended the meeting, and addressed the members on the aims and objects of a proposed fellmongering and woolscouring company.

At a subsequent meeting, held on the afternoon of April 7th, Mr. F. E. Place, B.V.Sc., M.R.C.V.S. (Government Veterinary Lecturer) gave a veterinary demonstration in the presence of 50 members and visitors, in which he explained the functions of the different internal organs of the horse. The meeting was continued in the evening, when Mr. Place delivered an address, "Foaling Troubles and Worms in Horses."

**SALISBURY, April 4th.**—Mr. F. W. Sayers read a paper, "The Care of Wheels," and gave a practical demonstration of painting, lining, and varnishing.

**WATERVALE, April 24th.**—The meeting was devoted to a general discussion on several subjects of local interest.

**WINDSOR, April 7th.**—Mr. H. Clark gave a further address, "Agriculture Abroad," in which he dealt with the farming practices in England, Scotland, and Ireland.

## YORKE PENINSULA DISTRICT.

(TO BUTE)

### BRENTWOOD.

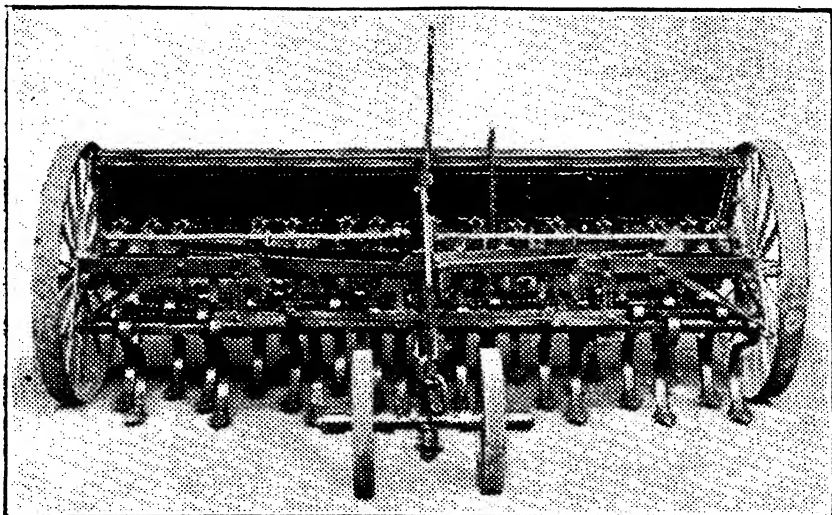
February 9th.—Present: 13 members and visitors.

**HARVEST REPORTS.**—Mr. J. Boundy gave a resume of the past season, and made the following comments on different varieties of wheat:—As was natural, he said, some varieties were affected with smut more than others, Gluyas being the worst, its appearance being very deceptive, and it was of light weight. Carawa, which was largely grown, gave the most satisfactory results. Florence Smutproof gave fair yields and good samples. Major, which generally yielded well, was very light in weight. Red Russian and King's White were both very badly affected by the rust. The quality of the wheat was a poor one for the district, where usually the sample was good, and was unsatisfactory for both grower and merchant. In spite of a larger area under crop, the returns were 10,000 bags less than previous years, 36,000 bags being delivered at the receiving centre, Port Minlacowie. The average yield of wheat for the whole district was between 10bush. and 12bush. The malting barley, of which 50,000 bags were delivered, was fairly satisfactory, yields being up to the average, although the quality was inferior to last year's, much of it being only medium. It was noticed that some parts of the district, which usually grew only fair quality, had an excellent sample this year. Prices for barley compared favorably with previous years. Average for the district, approximately, seven bags to the acre. Oats were not up to the usual standard, being too thin. Average yield about seven bags per acre. With the exception of rust, the hay yields were very satisfactory. In answer to an inquiry, Mr. Boundy said he intended sowing the following varieties of wheat next season:—Gluyas, Carawa, Federation, Red Russian, and Trumph.

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## KILKERRAN.

March 9th.—Present: seven members and one visitor.

CO-OPERATIVE POOLING OF WHEAT.—In the course of a paper on this subject, Mr. A. Sawade said the disposal of the wheat was one of the most important items in farming. If the crop did not mature or was affected by any disease, such as smut, rust, take-all, blight, or frostbite, the farmer could not be held responsible, because they were acts over which he had no control, but in selling the grain he could do just as he pleased, and he thought the pooling system was the best and fairest method of disposing of the wheat. That system was modern and up-to-date, and there was no necessity to worry about the wheat market.

## KILKERRAN.

April 6th.—Present: 11 members.

SEED WHEAT.—Mr. C. H. Obst, who contributed a short paper on this subject, held the opinion that the quality of the seed intended for sowing played an important part in the ultimate success of the crop. If the individual farmer did not have pure seed on his own property, he should purchase the grain elsewhere. Care should be taken in storing the seed wheat in the barn to keep the different varieties separate from one another. An additional cleaning with the winnower would remove a good deal of inferior grains from the seed, but to secure the best sample a grader should, if possible, be used.

A short paper on the subject, "The Best Method of Pickling Wheat," was contributed by Mr. R. B. Wakefield, in which the writer contended that the best results were obtained with formalin and the mechanical pickling machine. An interesting discussion followed, in which Mr. Keightly thought formalin was the best pickle for the seed, because it did not retard germination to the same extent as bluestone. Messrs. Grimwade and Sawade held that bluestone gave the best results if the solution was used in the proper manner. Mr. G. Heinrich discussed the methods of pickling, and was of the opinion that shovelling the grain on the floor was to be preferred, even though it involved two or three men to do the work effectively. Mr. Geater stated that the dipping method of treating the grain was quite effective, if the seed was not badly affected with smut.

MAITLAND (Average annual rainfall, 20.08in.).

April 1st.—Present: 11 members and visitors.

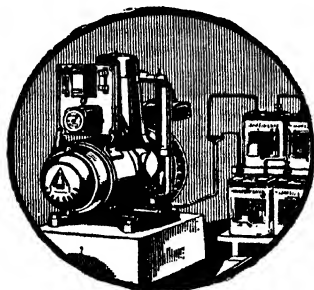
FARM LABOR.—In the course of a paper dealing with this subject, Mr. O. W. Jones said for some time past farmers had experienced considerable difficulty in securing suitable rural laborers, and while the majority of farmers wondered at that state of things, he thought that in many cases farmers were short-handed through their own fault. He was of the opinion that the farmer was to blame for not giving his farm hands just treatment and due consideration. The chief object of the employer should be to gain the respect of his men, and that could not be obtained unless the laborers were made comfortable and their work made interesting. Particularly did the speaker emphasise the necessity for giving the married man employed on the farm every consideration, and the master should see that opportunities were afforded for recreation. As to the matter of securing farm labor, he realised that that was entirely a different matter to that of the treatment of the rural laborers, but he thought a scheme similar to that of boy immigration from England might be applied to the youths of the cities. He believed that if some such plan could be brought into operation much of the unemployment in the city would be absorbed, and at the same time laborers would be found for agriculturists. In the discussion that followed, various suggestions were made regarding the treatment of farm hands. One proposal was that the employee should be given an interest in the crop, another was to endeavor to keep the men on the farm throughout the whole of the year. It was also stated that it would be better to establish married men on the farms rather than attempt to introduce labor from the city. The consensus of opinion, however, was that continuous employment was the solvent of the rural labor difficulty.



MOONTA (Average annual rainfall, 15.23in.).

March 18th.—Present: 11 members.

**CULTIVATION.**—In the course of a paper on this subject, Mr. T. G. Cliff said the cultivation of the soil, or the preparation of the seed bed for the future crop, needed very careful attention in order to obtain the best results. Cultivation should be commenced in the winter months by ploughing about 3in. deep, or a depth suitable to the soil in the district, and left in its rough state, to allow the atmosphere to permeate and aerate the soil. That, he said, was a most important point, because the roots of all plants were in need of air. It would also encourage bacterial activity, and liberate other plant foods. After the first rains the fallow should be worked to a fine tilth to conserve the moisture and break up the microscopic tubes formed by the rain. He preferred the disc cultivator, because it broke the soil down to a finer grade, did not bury so many clods of earth as the skim plough, and helped to compact the seed bed. After the fallow had been turned back to a depth of about 2in. he would harrow the land at right angles to the ploughing. After each rain it would be necessary to repeat the operation of harrowing the fallow in order to keep the weeds in check, and also to conserve



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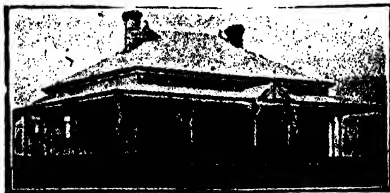
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moisture, which was an important factor, because the plant food could not be utilised unless in the form of a solution. The harrows were one of the most important implements on the farm for cultivation purposes. By their continual use the soil could be kept in a good mechanical condition. Light or sandy soil required careful working, and if ploughed in the winter it should be left in its rough state to minimise drift. Agricultural experts, he said, estimated a well-worked fallow to be equivalent to a 3in. rainfall, and would yield up to 7bush. of wheat per acre above neglected land. During the discussion which followed, Mr. Geo. Page said there were four main essentials to correct cultivation—preparing the seed bed, manuring, selection of seed, and rotation of crops. He favored running sheep over the fallow to pack the soil. Mr. T. H. Hooper harrowed frequently after the rain. The variety of seed or quantity of super were subordinate to having a good seed bed. A great mistake was often made, he said, by burning the stubble; it should be ploughed in as manure. Greater attention should be given to more scientific cultivation. Mr. J. Atkinson favored a good stubble burn, because it burnt up a lot of weeds and rubbish. He favored deep ploughing occasionally, in order to get some new soil worked up with the top soil. Mr. A. B. Ferguson thought the implement makers should co-operate more with the farmers in order that they could discuss the points of the cultivating implements. He favored the burning of the stubble in that district.

#### MOONTA (Average annual rainfall, 15.22in.).

April 8th.—Present: 19 members.

**WHEAT SELECTION ON THE FARM.**—In the course of a paper under the heading "Best Methods of Selecting Seed Wheat for the Farm," Mr. T. H. Hooper first drew attention to the experiments of scientists in Australia and other parts of the world in the sphere of plant breeding and seed selection. Continuing, the speaker said one method of seed selection that had the merit of being continuous and requiring a small amount of labor could be performed, if the following practice was carried out:—"A field of the variety of which it is desired to improve by mass selection is carefully inspected at harvest time, and sufficient of the best developed heads from well developed plants are selected to yield, on hand-threshing, from 5lbs. to 20lbs. of grain. This seed may be sown at seedtime as a 'stud' plot with the drill, using one or more hoes as desired. At harvest time a similar process of selection of the best heads from the strongest plants in the 'stud' plot is carried out, and the produce of the selection is reserved to form the 'stud' plot for the next year. The balance of the 'stud' plot is harvested and sown as the seed plot for the following year, and if the start was made with 20lbs. in three years there would be enough seed to plant about 200 acres. By continuing the 'stud' plots there would be fresh seed coming to hand each year which should be gradually approaching a pedigreed character. The full effect of the process will not be felt for at least three years—the time taken for the 'stud' plot to become the 'bulk' plot." The discussion was opened by Mr. J. Atkinson, who stated that if the farmer selected his seed, graded it, and took more care with the sowing and reaping of the crops, it would more than repay the grower for any extra labor that might have been involved. Mr. Brinkworth thought farmers should be more careful in selecting their seed wheat, particularly when taking the harvesting machinery from one variety to another. Mr. A. B. Ferguson was of the opinion that if the farmers took more care in keeping the seed wheat free from all foreign matter, heavier returns would be received at harvest time.

**PASKEVILLE, April 11th.**—Messrs. Jackson and Twiss attended the meeting and addressed the members re the establishment of a fellmongery and woolscouring factory at Adelaide.

**WEAVERS, April 13th.**—Mr. Dodd gave an interesting description of the practice of some of the farmers in the Brucefield district who drilled in the superphosphate on the fallow during the summer months. Several other matters of local interest were brought forward, and an interesting discussion followed.

**WESTERN DISTRICT.**

COORABIE (Average annual rainfall, 11in. to 12in.).

March 11th.—Present: 13 members.

**COST OF PRODUCTION OF WHEAT.**—Mr. R. Nicol read a short paper on this subject, in which, basing his figures on wheat at 4s. 6d. per bushel net at local shipping port and an average return of 8bush. per acre, he argued that wheat could not be profitably grown in the Coorabie district. Discussion followed, in which some slight differences of opinion were expressed as to the methods and figures adopted by the writer in arriving at his conclusions. Mr. Bastian said no one could clear and equip a local farm on present-day prices and show a profit on wheatgrowing alone with wheat at 4s. 6d. per bushel. The Hon. Secretary (Mr. H. V. Hobbs) said to increase the average yield per acre was one way to save the situation, and one that all producers should strive to accomplish. It was unanimously agreed that the absence of facilities to market produce prevented farming from showing a profit in that district. A railway and a market for other lines of produce were essential to enable settlers to practice increased stock raising and rotation of crops in conjunction with wheat growing.

McLACHLAN.

April 8th.—Present: 12 members.

**SEEDING OPERATIONS.**—The Hon. Secretary (Mr. W. F. Attick) read a paper, "Seeding Operations." At the close of the paper a short discussion followed. Most members were of the opinion that shallow ploughing was necessary in new

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mallee lands. The chairman thought that it was quite safe to sow dry wheat after the recent light rains, provided the grain was free from smut. Mr. Hayman stated that pickling wheat at the present time was risky on account of it malting unless it was thoroughly dried. The chairman also stated he favored harrowing after the drill.

#### MILTALIE (Average annual rainfall, 14.55in.).

March 11th.—Present: 10 members.

**HOMESTEAD MEETINGS AND THE BUREAU.**—Mr. D. P. Bagnell, who contributed a paper on this subject, expressed the opinion that the local Branch of the Bureau would become more progressive if, from time to time, the usual monthly meeting was held at the homestead of one of the members. If members were to each take a turn in having the meeting held on his property, and establish either cereal plots, a fruit garden, or dairying, or sheep, for the inspection of the visiting members, a great impetus would be given to the Branch. To obtain the best results from the homestead meeting, each member should keep a record of the time of fallowing and the conditions of the land at the time the seed was sown. Particulars of the varieties of wheat, the amounts of seed and super sown to the acre would also prove most interesting when an inspection was made of the paddocks. After harvesting, the results of the plots or paddocks could be presented to the meeting. To those interested in sheep he suggested that samples of each year's clip should be kept, and on the day of the homestead meeting the farm flock could be yarded for the inspection of members. The member that undertook gardening should be asked to hold a meeting of the Branch on his property during that time of the year when budding or pruning operations were being carried on, and a demonstration given in the garden. The fact that a proposal was on foot to open a butter factory should induce some member or members to establish plots of oats, rape, lucerne, &c., for dairy fodders; and the success or otherwise of the experiment would prove very beneficial and interesting to the whole of the district. Members, in discussion, agreed with the object of the paper—that of arousing fresh interest in the Branch, but it was generally contended that the majority of farmers did not have the time nor the money to devote to experimental work.

**VERMIN DESTRUCTION.**—The April meeting of the Branch was held at Mr. J. P. Storey's residence, when a paper on the above subject was read by Mr. W. J. Deer. The speaker stated that if every landholder would make a determined and sustained systematic effort to rid his property of vermin, fewer complaints would be heard regarding the ravages of foxes and rabbits. For the destruction of foxes the writer suggested that poisoned sparrows should be placed on the trails made by the vermin. The best time of the year to destroy rabbits was immediately after a fall of rain and before the green feed made an appearance. For that work he preferred the poison cart, but before commencing work he would make a thorough examination of all fences, and do any repairs that were necessary. Digging out was perhaps the surest method of destruction, but men with a large area of land could not adopt that practice. A most interesting discussion ensued, in which the arguments and views of the writer of the paper were supported. It was decided that Mr. H. Jacobs should be appointed as an inspector to co-operate with the district vermin inspector to assist that officer to enforce landholders to destroy rabbits within the area of the Branch.

#### MOUNT HOPE.

April 8th.—Present: seven members and visitors.

**AFFORESTATION.**—Mr. G. A. Vigar, who contributed a short paper on this subject, said as the 1921 Annual Bureau Congress had resolved that all Branches of the Bureau should, at one meeting during the forthcoming year, discuss the question of afforestation, he had decided to bring that subject before the Branch. Referring to local conditions, the speaker said that the rabbits and Nature had steadily reduced the edible grasses and bushes, but the sheoak, ti-tree, and mallee were still holding their own, and there was no doubt that as settlement and cultivation increased they also would be cleared from the land. He held the view that the time was opportune when a step should be made to renew portion



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April 1st, 1920.

WILLIAM CARTWRIGHT.

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of the edible grasses and bushes, by observing those places where the natural herbage grew, and fencing them in to keep out the rabbits. He believed that if that plan was adopted for a few years, edible trees, such as the sheoak and native oak, would increase the value of the land, and add to the beauty of the farm. In the discussion that followed, Mr. T. Speed supported Mr. Vigar's suggestions in fencing in young trees. He was of the opinion that the stock should be kept away from them for at least three years. He had noticed that young trees came up more readily on stone outcrops than on open country. Apart from native trees he advised planting the Tooart Gum in their locality. Mr. R. L. Myers was of the opinion that the tamerisk would be suitable for the class of land in their district. Mr. J. H. Vigar thought it was time a move was made to protect young trees, and thought a law should be passed forcing landholders to plant trees. Some very fine samples of seedless tomatoes were tabled by Mr. T. Speed.

### PYGERY.

April 15th.—Present: six members.

SEEDING OPERATIONS FOR THE DISTRICT.—Mr. A. P. Ingram, who contributed a paper on this subject, first enumerated the machines and implements necessary for the successful management of a 300-acre farm. He would commence ploughing about the middle of March, and if stubble land was to be cultivated he would work it to a depth of about 2in.; but if a good stubble burn had been obtained, and the surface crust of the soil was not very hard, the land would only need working with a set of heavy harrows about the middle of April. Calcutta oats, at the rate of 1bush. to the acre, with  $\frac{1}{2}$ wt. of super., should first be drilled in, and with an average season sufficient grain and hay should be provided for the team. Next, the work of drilling in the wheat should be commenced. For that district he suggested drilling 3bush. of wheat on four acres, with 70lbs. or 80lbs. of super to the acre. If the season was dry, and the grain free from smut, he would sow without pickling. If rain had not fallen since the plough had been put to work, he would simply put in the crop with the aid of the harrows. By the time the above work had been completed, operations should be well advanced into the rainy season, and all land brought under the plough should be harrowed before the drill, and all rubbish removed from the cultivated land. After the land had become sufficiently moist to wet the grain, he would resort to pickling. In the discussion that followed, Mr. Woodrup considered that it was always advisable to pickle before sowing. Messrs. Turley and Symonds thought that not sufficient use was made of the harrows in bringing the soil to a fine tilth.

### TALIA.

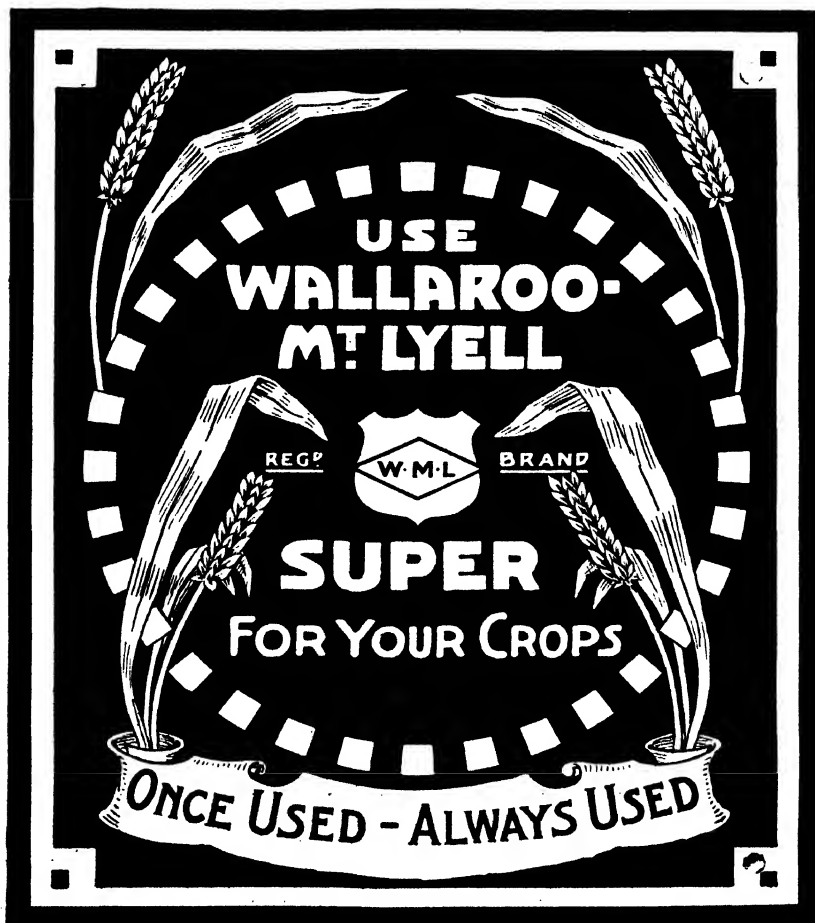
April 10th.—Present: 10 members.

FIRE FIGHTING.—In the course of a short paper on this subject, Mr. M. D. Kenny said 1921-22 season had proved one of the best years for natural feed on Eyre Peninsula, and that naturally had raised the question of the danger of fires in the minds of many of the settlers. In February a fire had started somewhere in the hundred of Cummins, and advice was received that every available settler would be required to fight the flames. Every landholder who possibly could, set out with the intention of doing his share of the work, but on arrival no one seemed to know exactly where to make a start, and there was no recognised head to superintend the work. He was of the opinion that it was time that the Bureau or some other public body took steps to avoid such happenings, and suggested the following plan:—(1) The appointment of one or two men to take charge of the men of his district. (2) That the public body should have maps of their own and surrounding districts in order to locate roads, and to know the exact position of the fire. (3) That every member should be equipped with a firebeater. (4) That on arrival at the fire, those men appointed to take charge of each district meet and arrange to fight the fire to the best advantage. In the discussion that followed it was decided to call a special meeting of the Branch during October, with the object of forming a "Fire Fighting Committee" at Talia.

YADNARIE (Average annual rainfall, 14.09in.).

March 14th.—Present: 13 members and three visitors.

**SHEEP JUDGING.**—Mr. W. L. Brown read the following paper:—"Wool grows best on sheep in good store condition throughout the year, but bodily defects play their part, even when the flock is properly managed. Condition is one of the principal factors in producing wool of good quality. Avoid sheep with slab sides, high sharp shoulders, or loose open shoulder blades. To detect these points, examine directly after shearing, and at the same time look for any defects in the wool. 'Devil's grip' is freely met with in Merinos, and consists of a dark semi-circular line, following the shape of the shoulder blades, varying from 4in. to 8in. in length, and from  $\frac{1}{2}$ in. to 2in. in width, and is more of an eyesore than anything else, although the wool is often washy. 'Grip' is seen mostly in aged breeding ewes, and if these are kept for wool production a certain risk is run.



It is generally caused by the sheep having a hard time in spring or following on shearing. If the shoulder blades are bare and prominent the line is noticeable. The movement of such shoulders causes the yolk to gather in the hollows. This melts in warm weather, rises to the surface, collects dust, and forms a black tip on the fleece. Between the higher level, caused by the prominent blades, and the lower level of the first rib, is the place to examine for 'grip.' 'Dead patch' is sometimes noticed at the top of the shoulders, and is common in excessively yolkly Merinos. In judging the wool capacity of sheep, note its quality, quantity, character, length, and condition. It is also necessary to be able to judge an animal in lean condition as well as when fat, as many sheep exhibited at shows are not in a natural condition. The best way to inspect a sheep is—first, open up the fleece at the shoulder, for there the finest and soundest wool of the whole fleece is found. Open out the wool with the flat of the hand, and part it as widely as possible. Next, compare the wool on the thighs. The difference will be noticed at once, as the lighter, coarser, and generally inferior wool is found on that part of the animal. Strict attention should also be given to the wool on the sides and belly, for in those places it frequently lacks character. Endeavor to strike an average between the wool on the shoulder, thigh, and belly. If poor and washy on the shoulders, pass it over, for, in addition to inferior wool, it will in all probability prove to be of a weak character. To bring a good price, the wool should possess density, length, and a general evenness over all parts of the frame. Density implies closeness of the fibres. Dense wool gives a heavier fleece, protects the body, and prevents straws, dust, &c., from getting into the fleece. Washy fleeces are easily penetrated by heavy rains and foreign matter, and these lessen the value of the clip. When sheep are starved or sick, a distinct break of the fibre can be observed. Wools of the Merino breed are known as broad, medium, and superfine, but for general purposes they are classed as short-stapled or carding wools, for the manufacture of woollen clothes, and long-stapled or combing wools used for worsted cloths. Quality of fleece depends on its soundness, softness, and crimp. Softness is found by pressing the fleece with the closed hand, and depends on breeding, management, and environment. Clay soils are to be preferred for the production of softness and lustre in the fleece. Crimp refers to the wave of the fibres. In some wool this is more noticeable than in others, and is of great importance, as it denotes the strength of the strand. A fleece with an even, regular wave, from the body to near the tip, is superior to a sample in which the crimp is irregular. Fineness is not looked for in crossbred types; with them the wave is more or large and open. To test for soundness, a lock should be drawn out and stretched evenly, and then gently flipped with one of the fingers, when it should have a distinct ring. If under this treatment the strands break, note the weak spots, as it may occur at the bottom, middle, or tip. The fibres may break while being stretched, but if they do so in different parts, soundness can then be noted, for the fault of it breaking is due to unnecessary rough handling. Look to the mouth for the age of sheep. Lambs are frequently born with one set of teeth, or these may appear in a few days later. They are peg-like, and more narrow than the permanent incisors, which are broad and wide. Making all due allowances, the teeth can safely be set down as appearing in the following order:—First pair permanents, at one year and three months; second pair, at two years and two months; third pair, at three years and one month; fourth pair, at four years. When all the teeth are down and in wear, there is little change for a year or so, but age and hard living will alter their character after the sixth year. By kneeling down at the side of the sheep and placing one hand on the floor of the chest, between and just back of the fore legs, and the other hand just back of the shoulder tips, lack of depth, as well as narrowness of chest and constitutional vigor, can be noted. By placing the hands on both sides of the body the width of the animal can be seen. The leg of mutton is best examined by placing one hand around the leg at the flank and the other around the rear at the thigh. The ears of a sheep should be smooth. Scabby ears are a fault. In mutton breeds, give preference to sheep that are low set, blocky, and have a compact appearance. The best advice given to those wishing to improve an inferior flock is to purchase the best rams their means will allow. Five and eight guinea rams, in my opinion, would improve most of the flocks in this district, where the sheep are used for the double purpose of cleaning up weeds on fallow and producing a fleece. Beginners at sheep breeding should get



a few staples of wool of a good quality, and compare it with that of the farm flock. By this plan they will be better able to judge good wool from that of an inferior quality. A staple of wool kept for this purpose should never be stretched or pulled, as it spoils its natural appearance."

#### YEELANNA.

April 8th.—Present: 13 members.

**TIME AND LABOR SAVING HINTS FOR THE FARM.**—Mr. H. Glover, who contributed a paper dealing with this subject, considered that all gates on the farm should be not less than 15ft. in width in order that the large modern implements could be taken from one paddock to another without any loss of time. If wooden or iron gates could not be afforded, a serviceable gate could be constructed with barb wire. The wires should be attached to a stick to which was fastened a piece of chain to go around the post. Another stick fastened to the chain could be made to serve the purpose of a lever for shutting the panel. After seeding, the drill should be overhauled, care being taken to remove the stars and plates and see that they were thoroughly cleaned. He thought a very strong and serviceable stable yard could be erected with wire and a good number of posts. If the dams were fenced and a pump erected they would be kept clean, and last for a considerably longer period than an open watering place. Before harnessing the team in the morning, the shoulders of the horses should be brushed clean of all dirt and dried sweat. Collars and other harness should also be looked after, and hung up after the day's work had been completed. A good dressing for the leather could be made from mutton or beef fat rendered down and mixed with neatsfoot oil.

**COLLIE**, April 5th.—The Superintendent of Experimental Work (Mr. W. J. Spafford), Mr. R. H. Macindoe (Veterinary Surgeon, B.V.Sc., M.R.C.V.S.), and the Secretary of the Advisory Board (Mr. H. J. Finnis) were present at the meeting, and delivered addresses on various phases of agriculture. On April 6th a veterinary demonstration was given by Mr. Macindoe.

**GREEN PATCH**, March 20th.—Several matters, including "Boy Immigration," "Wool Scouring," &c., were brought forward for discussion. In reply to a question regarding the stage at which the carob bean should be fed to stock, Mr. Sage said the beans should not be used until thoroughly ripe, and even then they should only be used in very small quantities.

**KOPPIO**, April 10th.—A very interesting paper on "Smut and Treatment to Prevent Same," was read by Mr. M. J. Gardner, and a good discussion followed, members generally favoring the floor system of pickling and turning with a shovel, as being more thorough than the dipping. Mr. Gardner gave a demonstration of air pockets left between the grains when the dipping system was employed.

**LAKE WANGARY**, March 11th.—Mr. Houston read an article, "Sheep Breeding," and the Hon. Secretary (Mr. A. E. Hawke) read a paper by Mr. F. E. Place (Government Veterinary Lecturer), "Medicines for Livestock." A good discussion followed, and several questions of interest were asked by those present.

**SALT CREEK**, April 8th.—The meeting took the form of a "Question Box," when a number of questions, chiefly relating to stock troubles, were brought forward for discussion.

**SMOKY BAY**, March 11th.—The Hon. Secretary (Mr. Geo. O. Lovelock) contributed a paper, "Care of Farm Implements," and an interesting discussion followed.

**SMOKY BAY**, April 8th.—The Hon. Secretary (Mr. Geo. O. Lovelock) read articles dealing with the subjects "Carbon Fertilisation" and "The Blowfly Pest," and a good discussion ensued.

**WUDINNA**, April 15th.—A member read a paper that had been contributed at the last Eyre Peninsula Conference, and an interesting discussion followed. Three members were nominated to attend the 1922 Winter School at Roseworthy Agricultural College.

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**EASTERN DISTRICT.****(EAST OF MOUNT LOFTY RANGES).****BRINKLEY.**

March 11th.—Present: Seven members.

**CARE OF FARM IMPLEMENTS.**—The Hon. Secretary (Mr. A. W. Richards) contributed a short paper on this subject. Owing to the high price of implements at the present time, he said, it was most important that every farmer should provide a shed to protect the machines when they were not in use. A straw-roofed shed with brush sides was sufficient, but a shed with stone walls and iron roof would obviate any danger from fire, and would not be a harbor for birds. All breakages and worn parts should be attended to immediately, and new bolts put on where necessary. The implements should be oiled regularly, and all bearings kept free from sand and dirt. He advised cleaning off all the old grease from the binder before using, and cleaning out the bearings with kerosine. Breakages to seed drills were frequently caused by allowing the drill to stand out in the open without any cover, and then starting the machine without trying the super runs with the handle provided for that purpose. A cover should be put over the drill at night. It would pay every farmer to have a blacksmith's shop on the farm. Repairs could then be done in a short time that would otherwise have to be taken to the township. When the bearings on the binder became worn, they could be made practically as good as new by running white metal into them. The farm wagon or trolley and all woodwork that was exposed to the weather should be given a coat of paint or oil every year. During the discussion which followed, Mr. E. W. Pearson agreed with the writer that a stone shed with an iron roof was the safest. Mr. A. B. Martin favored a shed with high stone walls and a straw roof, because it was cooler in the summer.

**BRINKLEY.**

April 8th.—Present: nine members.

**THE FUTURE PROSPECTS OF FARMING.**—Mr. E. W. Pearson read the following paper:—"This is a subject in which we are all more or less interested, and the remarks that I wish to make are intended to apply to our own district only. There are, to my mind, certain indications which seem to tell us that farming, under present conditions, will in all probability prove unprofitable. In the first place, I would refer to the practice of fallowing. Every farmer who has had any experience at all knows that fallowing is one of the main factors in successful wheat growing, and if the question was asked, 'Can we grow wheat at a profit without fallowing?' the answer would be, in most instances, 'Certainly not.' Notwithstanding these facts, I venture the opinion that we shall have to abandon fallowing altogether on most of the land in this district. My reason for thinking so is because of the serious damage caused every year by drifting. This, of course, is most noticeable on those farms that are practically free from mallee shoots and other rubbish, which, when present, prevent the land from drifting to any great extent; but experience has proved to me that so soon as we commence to make the land clear of all shoots and roots, troubles begin; and whilst many things have been advocated to combat the evil, I question whether any of them are of any use except in cases where the area liable to drift is in small patches. To state my own case. We have a holding of 2,570 acres, about 2,000 of which is cleared, and the greater part of this area is subject to continual drifting when the strong winds which we so often experience are blowing. The point I wish to emphasise is this—with each succeeding fallowing the surface soil is being carried away, and already, after about 12 years' working, I find that in many places the plough is bringing up the clay when working at a depth of 3in. What are we going to do? To continue to fallow means ruination to the land, while to discontinue means unprofitable farming as far as wheat growing is concerned. During recent years the price of wheat has been sufficiently high to enable us to grow it at a small profit; but in the event of wheat falling back to prices that obtained previous to the year 1914, and taking into consideration the excessive high price of all farm implements and machinery, together with the high rates ruling for suitable

farm labor, the question that confronts us is this: if it becomes necessary to cut out the fallowing, which hitherto has been the backbone of the success of our calling, what are we going to do? In the first place, I would recommend the keeping of more live stock, as it has been proved that all classes of stock will thrive and do remarkably well in this district, provided that they are managed in a proper way. Sheep and cattle could, I feel sure, be reared and fattened on farm products, but to carry out this work successfully we must have the land fenced and divided into as many paddocks as possible, as all kinds of live stock will do better if moved from one paddock to another at regular intervals, than if allowed to roam over the whole farm continually. One argument in favor of live stock is that they are continually returning to the soil that which is required to produce a greater abundance of feed; whereas wheat growing is continually taking from the soil and putting nothing back. Another point in favor of live stock is that they can be made to harvest the crop, which saves a lot of labor and expensive farm machinery. Then, I am of the opinion that a liberal dressing of superphosphate on the paddocks left out for grazing would prove profitable. We would not only increase the stock-carrying capacity of the farms, but would, in time, be able to grow heavier crops. If it should become necessary to turn our attention in this direction, I would recommend the sowing of crops in the following way:—Instead of fallowing in the winter or early spring, allow the land to lie idle until the end of summer. As soon as rain comes and the weeds begin to grow, start the skim plough or cultivator going, and follow with the drill, sowing oats, barley, and other forage crops. These could be fed off until about August, then if it is desired, the crops could be cut for hay or grain, or left for the stock to harvest." An interesting discussion followed, in which members agreed with the views of the writer of the paper.

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**LAMEROO (Average annual rainfall, 16.55in.).**

April 8th.—Present: 17 members and visitors.

**FALLOWING.**—The following paper was read by Mr. G. Burns:—“Every farmer will agree that well-worked fallow is a most necessary condition for the production of profitable crops of wheat. The advantages of winter or early spring fallow are commonly recognised, and can be briefly summarised as follows:—1. We can to a large extent clean our land. 2. We can conserve moisture by keeping the top layers of soil in a loose condition. 3. The work is more evenly distributed over the year. 4. We are able to prepare a good seed-bed for the wheat. It is a great mistake for a farmer to undertake to fallow more land than he can harrow and cultivate at least once before hay time. Rather than have indifferently worked winter fallow, I would leave the land under pasture, secure a good burn, and fallow it during the autumn. One important point in fallowing is the depth of ploughing. I consider that the advantages of deep ploughing have yet to be demonstrated. In this country especially, where our land is still subject to take-all, deep ploughing is a great mistake, except in years of very abundant rainfall. One great essential in wheat-growing is a good firm seed-bed, not more than 2in. below the surface, and we cannot obtain this if we plough deeply unless we have a great deal of rain or are prepared to use a heavy roller. Where rubbish will permit, the first working could be carried out with a spring-tooth cultivator fitted with very narrow shares. This would just cover the weed-seeds and encourage their germination, and the soil would work up to a fine tilth at the next working. The subsequent workings could be performed with the cultivator; a plough, of course, would be necessary where thistles or other strong growth were prevalent. The objective of the farmer should be to finish seeding with a fine covering of about 2in. of soil over a good firm seed-bed. One of our great difficulties is the growth of summer weeds on the fallow. I have a strong growth of stinkwort on my fallow, and have come to the conclusion that, instead of waiting and waiting for rain, I should have lightly worked the ground when the weed was small, even though the land was dry. If we have our cultivators set evenly and work the ground lightly, taking care to keep the levers working, I do not think that we will promote take-all by dry working. Although keeping fallow clean will kill a tremendous lot of weeds in a wet year, not any amount of working in one year will make it safe for us to sow wheat dry and be certain of a clean crop. One has only to examine a clod to see the number of weed-seeds that are only awaiting favorable conditions for germinating. For summer fallow an inch, or as near to that as one can get, is quite deep enough. Here again the spring-tooth cultivator, with points attached, comes in useful if a good burn has been received. The object of summer fallow is to just bury the weed-seeds, to promote even absorption of the rain, and to break the surface, being careful not to bring up clods, so that the ground with one more cultivation and a harrowing is in good mechanical condition to receive the seed. The following salient points should be in the minds of every farmer at ploughing time:—1. Fallow as early as possible after seeding. 2. Do not fallow more than you can work thoroughly, especially if no sheep are kept on the holding. 3. Keep sheep if possible. 4. Work the fallow at a shallow depth all the time. 5. Work it whenever weeds render a cultivation necessary. 6. See that implements have their tynes set evenly.”

**LOXTON (Average annual rainfall, 12in. to 13in.).**

March 30th.—Present: 10 members and visitors.

**SEEDING OPERATIONS.**—The following paper was read by the Hon. Secretary (Mr. A. W. Traeger):—“In dealing with this matter I will place it under four separate headings:—(1) Preparation of land, (2) Manuring, (3) Variety of wheat, (4) Pickling. (1) Should a farmer require to sow stubble land which is free from weeds? I have always found the early sowing to yield the best returns. I do not advise ploughing the land deeply when dry, as this has a tendency to bring take-all. When the land is clean, a light cultivating does just as well; in fact, I have just drilled the land at times when the discs have covered the seed properly and have had returns as good as from the ploughed land. I believe in fallowing my land, and always sow wheat on it. The next year I sow the same ground with oats, which improves the land and gives excellent feed for the cattle.

In the case of dirty land, I advocate ploughing very early and then cultivating after a good rain, when the weeds should be easily destroyed. (2) I consider about 45lbs. to  $\frac{1}{2}$ cwt. to be the best amount of super to apply to the soil. (3) I strongly advise the grading of wheat for seed. Those who have not used a grader cannot realise the amount of small and damaged grain that is removed from the seed. The best varieties to sow in this district are Early Gluyas, Golden Drop, and Silver Bart. Silver Bart is an excellent hay wheat, and can be sown early. When sowing late varieties always plant them early. (4) When pickling, I empty three bags of wheat on the floor, take 1lb. of bluestone to three gallons of water, and sprinkle the mixture over the grain, and shovel the wheat well until every grain has been damped. My crops have always been free from smut." In the discussion that followed, Mr. Beverley asked if any member had ever seen smut in a self-sown crop? Two members had. Mr. Mayfield did not believe in sowing wheat without pickling in the beginning of the year when it was dry. He had done so and had smut, and that which had been pickled had been free from the disease. Mr. R. E. Thiele agreed with the writer in the matter of pickling, but suggested an addition of  $\frac{1}{2}$ lb. salt to each gallon of water. Mr. Sadleir thought that smut was caused by reaping the wheat too early. He was a strong believer in fallow. It was generally agreed that the harrows were necessary in obtaining the best results.

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

April 8th.—Present: 13 members.

LIME BURNING.—In the course of a short paper on this subject Mr. C. Harper said the site selected for the kiln should be a piece of land containing a hard clay subsoil. An excavation, 7ft. square on the surface, 6 $\frac{1}{2}$ ft. square at the bottom,

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and 5ft. in depth, would hold about 24 bags of lime. The draught entrance should be sloped to the centre of the kiln, and a small hole about 1ft. square made through to the bottom. A small trench at the bottom of the kiln was also necessary to provide for a regular and even burning of the fuel and stone. When making preparations for burning, a small bundle of lighting wood should be placed close to the draught entrance. Next, 2ft. of mallee roots should be laid down. On top of that should be placed 9in. of limestone. That plan should be followed out until the kiln was filled to the top, when a layer of small stones should be used to shut in the heat. A round kiln would be found to give much better results than a square one. When the fire was well alight the draught could be shut off, and to secure the best results, fairly large solid roots, not too dry in condition, and with stone broken to a 4in. gauge, should be used.

#### NETHERTON.

April 7th.—Present: 13 members and five visitors.

**FARMING IN MALLEE LAND.**—Mr. W. R. Peake read a paper on this subject. He was of the opinion that it did not pay to fallow new land whilst there was green mallee growing on it, because the shoots would rob the soil of so many essential plant foods. In cleaning the land, he said fire-raking would not be a success, because the burning of the cut tops would not produce sufficient heat to check fresh growth. The object should be to kill the mallee with fire as quickly as possible, and he knew of no better way than to sow on a clean scrub burn, with the object of obtaining a heavy stubble for the next burning season. Regarding the fallowing of land after it had carried an oat crop, Mr. Peake did not think that plan was always advisable, because it frequently happened that sufficient seed was shaken out to produce a self-sown crop that would prove splendid grazing during the spring months, and later on in the year a running fire could be obtained from the straw. From experience that he had obtained in the mallee lands he was of the opinion that considerably more than £500 was needed by the settler taking up a scrub block to bring his venture to a successful issue.

**PARILLA** (Average annual rainfall, 16in. to 17in.).

March 10th.—Present: eight members.

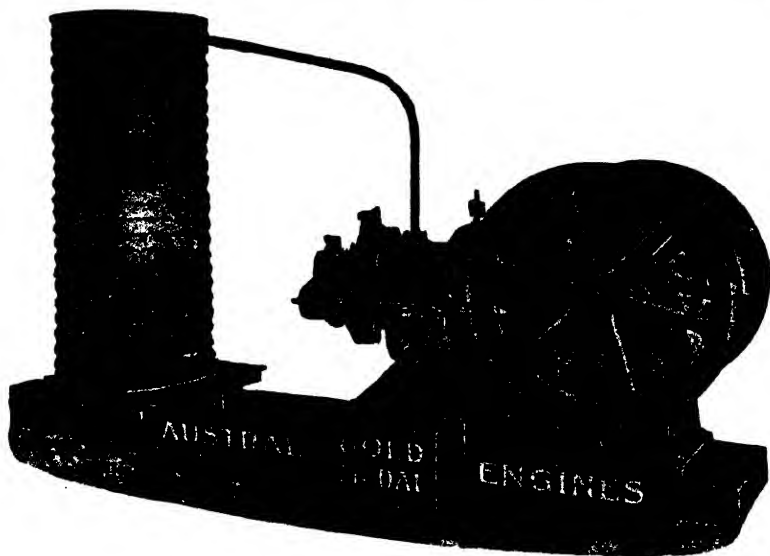
**SORE SHOULDERS ON HORSES.**—Mr. S. A. Gregory, in a paper on this subject, said that the collar should be made to fit the horse correctly, and the leather should be well oiled to make it pliable. The same collars should always be used on the same horses, because their shoulders varied considerably. The draught was also an important item, and it should be neither too high nor too low. The lining of the collar should be full in the centre and very thin at the top and bottom, otherwise the pressure would be on the wrong part of the shoulder. Some people considered that too much corn in the feed was one of the causes of sore shoulders, because it caused boils to break out, which spread into large sores through the pressure of collar, but a tablespoonful of sulphur mixed with a little bran in the feed given once every two weeks would help to cool the blood, and thus prevent boils. If a horse was thin-skinned, he would use a bran bag breastplate, made as follows:—"Fold a bran bag to the width required, pass a piece of ½in. round iron through a short length of gas piping, bending the whole to form a bow, and rest it on the folded bran bag." An old wheat bag should be used over the neck to keep the breastplate in position. The chains could be attached to the ends of the ½in. iron which was bent back short to form hooks. Gall cure was a good remedy, and should be well rubbed in before taking the horse to work. If the horse was spelled for a little while, lime could be sprinkled on the sores, and they would dry up quickly. An interesting discussion followed the reading of the paper. Mr. G. E. Gregory said the horse's blood should be kept in good order. He advised soaking the collar in water and working it on the horse when wet, but it should be well oiled so soon as it was dry. The hot, sultry, and showery conditions during August often caused sores, and it was better, if possible, to spell the horses at that time. An extra horse in the team would often save much trouble. He suggested the use of a gall cure, consisting of olive oil two parts and Friar's balsam one part, well mixed together, and applied daily. Colts' shoulders should be bathed with lukewarm water containing salt. Mr. E. J. Kerley found vaseline to be an excellent gall cure.

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WILKAWATT (Average annual rainfall, 16in. to 17in.).

April 8th.—Present: seven members.

PICKLING WHEAT.—Mr. E. W. Brooker read the following paper:—"For the prevention of smut in wheat I would recommend a 2 per cent. solution of bluestone. The practice, I find, to be very effective is to make a receiving hopper out of bagging in the form of a crab net, place it over the top of the barrel, and pour in the wheat. By so doing one is able to skim off the smut balls that rise to the surface, and make sure that those not on the surface will burst in the pickle, and thus become harmless. I prefer this method to that of dipping the wheat in the bag. In my opinion, wheat should be left in the pickle for 10 minutes.

THE HORSE AND FEEDING.—"The horse is man's most intelligent and useful servant, but is in many cases shamefully neglected," said Mr. W. J. Bowman in a paper under the above heading. "That statement," he said, "was borne out by the number of raw-boned and sore-shouldered animals that one saw on farms and on roads, and proved gross neglect on the part of the owners. The horse that was not well fed and cared for could not be expected to render true and faithful service to its master. If a man was compelled to work from four to six hours a day in the heat of summer without a drink he would become exhausted, and when allowed access to water would, in all probability, drink too much for his good health. The same argument could be applied to the horse. Under such circumstances a man should only partake of small quantities of cold water at such intervals until his thirst had been allayed; and if horses were handled in somewhat the same manner he believed fewer rough-coated, lame, and stiff-jointed animals would be seen in the country. The watering of horses, before and after feeding, was a very much discussed point, but as water in the stomach was absolutely necessary to enable the horse to properly digest its food, he contended that drinks, in reasonable quantities, should be given both before and after meals. The stomach of the horse was known to contain, when full, about 19qts. That should be borne in mind when measuring the rations, and if chaff and oats were being fed, 10lbs. of chaff and 4qts. of oats would fill the stomach."

#### YOUNGHUSBAND.

April 13th.—Present: 10 members.

PREPARATIONS FOR TIMES OF DROUGHT.—Mr. G. Hallett contributed a paper on this subject, in the course of which he said there were three points that should constantly be in the minds of all men on the land—(1) the conservation of fodder for stock, (2) the careful stocking at all times of the holding, and (3) the storage of a certain amount of seed wheat every year. The conservation of fodder should cover the storage of all surplus fodders that could be obtained during good seasons, and should include hay, cocky chaff, and straw. During times of drought it was usually bulk fodders that were needed, because molasses, bran, and other concentrated foods could be added to the ration. Self-sown hay or straw could be stacked in the fields, but for the cocky chaff he thought a storage shed should be used. Failing that, the cocky chaff could be made into heaps in the paddocks and covered with a thick layer of straw. The careful stocking of the holding was a very serious question. The farmer who generally only stored sufficient fodder for his stock to carry over until the next season should be especially careful not to overstock. The speaker also thought it a good plan for the farmer to carry a sufficient quantity of seed wheat on hand to cover seeding operations for two seasons, so that in the event of a crop failure, enough grain would be stored to carry on with the next year's seeding. An interesting discussion followed. The question of rabbit destruction was brought forward, and it was generally agreed that phosphorised pollard, distributed with the aid of the poison cart, was the best method of keeping the pest in check.

BARMERA, April 4th.—Mr. T. Strachan delivered an interesting address, "The First Three Years' Work on the Block," and replied to a number of questions.

CLANFIELD, April 10th.—The meeting was devoted to a discussion on the 1921-22 harvest. Members considered that the severe hot weather experienced during October accounted for the poor finish of many of the wheat crops. The

said he had sown wattle seed alone and also with oats, and it had grown well in both cases. He advised boiling a can of water, taking off the fire, and then placing the seed in a bag in the water for about half an hour. All the seed might not germinate during the first year, but it would continue to come up for two or three years.

LONGWOOD (Average annual rainfall, 37in. to 38in.).

April 8th.—Present: Eight members and two visitors.

THE FINANCIAL ASPECT OF DAIRY FARMING.—The Hon. Secretary (Mr. J. B. Coles), who contributed a paper on this subject, said there were many holdings in the Hills districts where, in addition to the orchards, half a dozen cows could be kept with advantage. The speaker was of the opinion that in years past the dairying industry had been carried on at the expense of the happiness of the farmer's children. The cost of production was still high, whilst the price for butter was back to normal figures. The Australian Official Year Book showed that for five years, up to and including 1917, South Australia had 6,000 people engaged in dairy work, handling 93,916 cows, or an average of 15 cows per individual, while the average milk production per cow was 289 galls., and the total amount of butter produced 11,934,222 lbs. From a glance it would be seen that at that time the dairying industry in South Australia was not in a very thriving condition, and to make it successful under present market prices—butter about 1s. 6d. per lb.—the above figures would have to be increased at least two and a half times. After quoting further figures in support of his arguments, the speaker expressed the opinion that dairy farming in South Australia could only be success-

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fully carried out under good and careful management, with the very best of dairy stock. The meeting was held at the Hon. Secretary's residence, and afternoon tea was provided by Mrs. Coles. Samples of various varieties of apples and pears were exhibited, also a 3in. drain pipe from the local pottery factory.

**MORPHETT VALE, April 13th.**—Considerable discussion took place on the subject, "Stack Building," when it was agreed that great care had to be exercised if the stack was to be made thoroughly waterproof. Discussion also arose on the strengths of various supers and the quantities per acre to apply. On some of the best land that was only occasionally cropped, it did not pay to use manures, whereas on the poorer class of soils dressings of superphosphate were imperative. One member strongly recommended disc implements for light draught and good cultivation.

### ROCKWOOD.

March 13th.—Present: 15 members.

**MIXED FARMING.**—Mr. A. Carter, who contributed a paper on this subject, said a farmer possessing 500 acres of land in a district of good rainfall could work the land profitably by putting 250 acres under cultivation each year. One hundred acres should be devoted to wheat, 50 acres sown with oats, of which at least 25 acres should be cut for hay. For pig feed he recommended putting in from 20 acres to 25 acres of peas. With a 5-acre plot of lucerne one should be able to keep about 12 cows, preferably Jerseys. If the land was not suitable for lucerne-growing it would be advisable to go in for the conservation and growing of green fodders. Maize was the most suitable crop for that purpose; peas and oats were also recommended. A farm of 500 acres would require a team of 12 horses to work it. Eight would be required for cultivation purposes and four for light work. One hundred ewes, preferably crossbreds, could be carried, and if mated with Shropshire rams early lambs could be produced at a very profitable figure, while considerably more sheep could be kept if they were hand fed. Farmers should beware of "the waster," he said, whether animal, implement, or machine, that was not returning the proper value to the farm for the money that was spent on it. If a horse was a poor "doer," or a lazy worker, he should be disposed of, because such an animal would eat just as much as a willing and well-conditioned horse. He considered it a mistake for a farmer to dispose of his horses when he had been offered a good price for them, because the work could not be performed in the same time with a team of old horses, and, as a rule, one had to provide better fodder for older horses. Also, if one paid close attention to the farm flock, a number of sheep would possibly be found with loose wool and other defects in the fleece. Such sheep should be culled, and sold to the butcher. The dairy herd should be tested, and all cows not giving a payable percentage of butter fat should be disposed of. Old and out-of-date implements and machines were another source of waste. During the discussion which followed, Mr. L. Heath said if more sheep were kept in addition to wheatgrowing, the land would soon wear out. Mr. Steed was of the opinion that by good management the producing capacity of most farms could be considerably increased. Mr. Ness thought that eight horses for heavy work and two light animals should be sufficient for the average farm. He questioned whether it would pay to grow green fodders. If such crops were sown on fallow they would prevent the working of the land, and there would be the cost of the seed and super. The Chairman said peas were excellent for enriching the soil. Mr. Scott stated that where a crop of peas had preceded oats, the latter crop had yielded double the harvest.

**GENERAL MANAGEMENT OF HORSES.**—Mr. H. C. Dunn read a paper on this subject. The two most important items in the management of the horse, he said, were feed and water. He was of the opinion that the more water one could get the horse to drink, the less chaff the animal would require to keep it in condition. The horse should be watered before feeding, because its stomach was small, and the water passed directly through the small bowel into the larger one, and if fed previously the water would carry masses of undigested food with it. The speaker did not think it would hurt a horse to drink when hot if the animal was accustomed to it. If a horse was inclined to drink too heavily, or to become griped, he said the trouble would cease if the bit was left in its mouth when drinking, because

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THE AGRICULTURAL BUREAU.—Particulars of this Organization, of which every farmer should be a member, can be had on application to the Department.

it would prevent him from taking too much. The average amount a horse could drink per day was about 8galls. in two or three waterings, but in very hot weather 20galls. constituted a good drink. Grooming was a matter of minor importance; the idle horse in the paddock that did not sweat freely did very little towards cleaning himself, but the working horse, on the other hand, if in good condition, cleaned himself by sweating, and a roll before returning to the stable would dispose of most of the dirt, but in the morning his shoulders and mane should be brushed down. The secret of the art of grooming as an aid to condition was to carry it out speedily and with a will. The horse should not be given a large quantity of chaff, but just as much as it could pick up in the time at its disposal. A bran mash should be given once a week. Dry bran, as given with food, was valuable, but did not have the laxative effect of a mash. The mash was best prepared by placing a couple of double handfuls of bran into a dry bucket, with a tablespoonful of salt, and pouring water that had just gone off the boil on to it, stirring well while doing so, then covering with a wheat bag, and allowing it to steam until cool enough to be fed to the horses. Another advantage of the soft mash was that it enabled a horse to get rid of beards and grass seeds that so often caused serious trouble in the mouth. Those seeds should be looked for regularly and removed. The harness and harnessing up were important items in the management of the draught horse. Sores frequently made their appearance, and interfered with the utility of the team. They were, as a rule, caused by either friction or pressure. An animal in poor condition showed the effect of friction sooner than one in good condition, the first sign being the rubbing of the hair and then the appearance of a hole in the skin. Pressure acted differently; it cut off the blood supply to the skin, and killed the tissues of the body. An animal in good condition had hard, rubber-like muscles to relieve the pressure, but even in that case the constant weight of a badly fitting saddle or a poorly shaped bridle would produce a sore back or poll evil. Not more than one-twelfth of the weight of the load should rest on the back, nor should the weight be continuous. Friction was the chief cause of collar trouble, and the secret in fitting a collar was to make it fit closely to the neck, in order to reduce friction. The inner edge of the collar should rest closely against the side of the neck. Enough space should be left between the inside of the body of the collar and the neck to insert the fingers; more space than that would allow too much side play, and would chafe the neck. The crest of the neck should not be pinched; that was a common fault with many collars, and was the cause of sore withers. The collar should so fit as to enable the teamster to place his hand and wrist between it and the neck at the bottom; that would allow sufficient room for it to rise. The hames should in all cases take the shape of the collar. A collar that fitted a horse when in good condition would become sometimes as much as 3in. too wide when the animal fell off in condition. During the discussion which followed, Mr. Carter said that sore shoulders were sometimes very difficult to cure. Gall cure, he thought, was the best curative. He suggested placing a sheepskin under the collar as a preventive. Mr. Holmes said warm water and soft soap was beneficial. Mr. Ness said he had tried a sheepskin, but without success. He found that if horses were given bran and a few packets of Epsom salts once a week, there would seldom be any illness amongst them.

## SECOND VALLEY.

April 1st.—Present: 14 members.

**REARING OF DAIRY CATTLE.**—Mr. G. W. Cant, who contributed a paper on this subject, said as a general rule it could be stated that the dairyman should raise at least as many heifer calves as was required by him to fill the vacancies that from time to time occurred in the herd. The cost of raising the cattle depended to a very large extent on the facilities that the farmer had for keeping the young cows. Heifers raised on the farm were, as a rule, more suitable to the district than those purchased from outside breeders, and he was inclined to think that the breeding and raising of good-class stock would always be a payable proposition in South Australia. Referring to breeding, he maintained that the cows should be fed throughout the whole of the year to keep them in good healthy condition, and each cow should have a rest of at least eight weeks between drying off and calving.

When the calf was dropped he allowed it to remain with its mother for from eight to 12 hours. For the first three days three quarts of pure milk should be given to the calf each day. During the next fortnight he made a practice of giving the calf about equal quantities of fresh and separated milk, and as time went on the fresh milk was reduced to about one pint per day. He was a strong advocate of giving a certain amount of fresh milk each day, for he believed it reduced to a minimum any danger of the young animals becoming affected with scours. Failing new milk, boiled linseed should be added to the separated milk. At three weeks old the calves should be encouraged to eat small quantities of sweet hay. After the age of six weeks each calf should be given a small quantity of good chaffed hay with a couple of handfuls of bran and one of crushed oats, not forgetting to add to each meal a pinch of salt. From 10 weeks to three months of age he favored keeping the youngsters in a clean and warm shed with a liberal supply of clean straw. Each calf should be fed separately from a clean bucket, with milk as near the temperature of the natural product as possible. From the shed the calves should be transferred to a small paddock, and fed with chaff in addition to the natural pastures. By rearing the calves in a thorough manner he contended that the dairyman should be able to milk the heifers at two years old. For that district he thought the calves should be dropped in April. An interesting discussion followed.

ASHBOURNE, March 13th.—To an attendance of 20 members and visitors, the Assistant Dairy Expert (Mr. H. J. Apps) delivered an address, "Dairy Farming." At the conclusion of the lecture, Mr. Apps replied to numerous questions.

BALHANNAH, March 10th.—The chairman (Mr. H. N. Wicks) contributed a paper, "Bud Selection," to a gathering of 14 members, and a most profitable evening was spent. At a further meeting held in April a paper, "Lime and its Relation to Manures and Soils," was contributed by Mr. H. C. Pitt, and an interesting discussion ensued.

HARTLEY, April 5th.—The Hon. Secretary (Mr. W. B. Hudd) read papers dealing with the subjects, "Whole *versus* Crushed Oats for Calves," and "Wheat Diseases." An interesting discussion ensued. Other items of local interest were also brought before the meeting.

KANGARILLA, April 7th.—Mr. W. Bottrill read an article, "The Broad Leaf Wattle," which was well discussed. Mr. A. Bottrill spoke on the process of cutting and stripping wattles, and observed that in some cases the trees made a fresh growth, but growers were of the opinion that the trees would not grow again after stripping. Mr. V. Biddle thought the bark was of better quality when the trees were grown without cultivation. Mr. L. Smart thought a sowing of 2lbs. of seed to the acre quite sufficient for cultivation purposes. Members were of the opinion that it was advisable to trim the young trees, and Mr. Smart had noticed a marked difference after that had been done.

PORT ELLIOT, March 11th.—Mr. H. J. Apps (Government Dairy Assistant) attended the meeting and delivered an address, "The Dairying Industry."

ROCKWOOD, April 10th.—The meeting took the form of a social evening. During the course of the evening Messrs. Deiner and Henly delivered addresses dealing with the work of the Agricultural Bureau. Supper was provided by the ladies, and a most enjoyable evening was spent by all present.

## SOUTH-EAST DISTRICT.

FRANCES (Annual annual rainfall, 20.74in.).

April 1st.—Present: five members.

THE BLOWFLY PEST.—Mr. Pfizner, who contributed a short paper dealing with this subject, was of the opinion that simply crutching the sheep was only a waste of labor, and allowed the flies to make a direct attack on the skin of the animals.

He had found that by removing the dags and taking a proved arsenical dip, made double strength, and used in conjunction with a liquid dip to make the solution more penetrating, that the attacks of the flies were considerably reduced. A lengthy discussion followed, in which all members present held that crutching was a most necessary operation. They contended that a thorough crutching of the ewe was the only way to protect the sheep from the attacks of the flies.

#### KYBYBOLITE (Average annual rainfall, 22in.).

April 13th.—Present: nine members.

Mr. A. E. Cother contributed a paper, "The Breeding, Rearing, and Stable management of Horses," and at the conclusion replied to the undermentioned questions:—Question—"Would you recommend hoseing horses in summer?" Answer—Horses can be hosed with advantage in hot weather, but careful discrimination should be exercised in cold weather. If hosed in cold, wet weather, always do so when the animal is hot, and not when cooling off. They should always be dried, and the use of a rug for a few hours would be an effective preventive against chills. Question—"Would you consider a horse to be overworked when respiration is accelerated?" Answer—It would largely depend if respiration is labored to any great extent. If breathing was very labored it could be taken that the horse had been overworked. Question—"Would the feeding of concentrates cause horses entering the stable dry to become wet with sweat after standing for a time?" Answer—Such a condition might be brought about by the quantity and not the quality of the feed. It was always advisable for horse owners to provide a sand bath in a small yard in which to allow the horses to roll when coming in from work. That was Nature's remedy for cleaning the skin and closing the pores, and if animals were allowed and encouraged to roll many ailments would be reduced to a minimum. Question—"Is ring bone hereditary?" Answer—Undoubtedly, and it had been proved to be so.

#### LUCINDALE (Average annual rainfall, 23.32in.).

March 25th.—Present: eight members.

ARTIFICIAL MANURES.—In the course of a paper dealing with this subject, Mr. P. J. Burke said, while it was almost universally recognised that it was necessary to use artificial manures for the successful production of agricultural crops, he was of the opinion that the majority of farmers did not go far enough in the application of manures to the soil. The question was frequently asked, "Why can we not grow crops without manures, as our fathers did in years gone by?" He believed that that fact was due to the depletion of phosphates from the land. It was contended that sheep returned more to the soil than they took out of it, but he doubted that assertion when one considered that what was taken by the sheep largely went towards the building up of a fleece of which it was annually shorn, and also a carcass of mutton, which ultimately left the farm. The sheep extracted phosphates, &c., from the soil, but it only returned in the form of droppings, humus, ash, and ammonia. He believed that cattle depleted the soil of phosphates to an even larger degree than sheep. From the foregoing statement it would readily be noticed that even if the soil was not cropped it required dressings of artificial manures. Referring to crushed phosphate rock, the speaker said that manure had one advantage, in that it had a sweetening effect on sour land, while super had a tendency to make the sour land sour; but, on the other hand, the plant foods contained in superphosphate were immediately available for plants, while the crushed rock took a very long time before it became water soluble. He urged farmers to use superphosphate not only for cereal crops but also as a dressing for grass lands. The top dressing of pastures was no longer in the experimental stage, and in districts such as theirs, where a heavy rainfall was received, he believed superphosphate was the best artificial manure that could be used for the purpose. That was proven by the fact that one frequently saw

the stock leave uncultivated land that might be carrying a good crop of grass, and graze on a cultivated area on which there was only scant pasture. Top dressing of the pastures would result in healthier stock and a greater carrying capacity of the farm. It would also cause clovers and other grasses to grow, which, in their turn, would supply nitrogen to the soil. The dressing of super-phosphate, in reality, had a double effect. First, it had the effect of hastening the ripening period of all plants, and, secondly, it brought about an increased yield of seed. Referring to potash, the speaker said there were fairly good supplies of that fertiliser in the majority of South Australian soils, so that there was no need to apply it, except on lands cultivated for orchard and vegetable crops. Nitrogen was another essential plant food, and could be brought into the soil by the growing of leguminous crops, or the application of nitrate of soda or sulphate of ammonia. Lime was not a direct fertiliser, but an application had the effect of liberating the plant food in the soil. In addition to that it had a sweetening effect on sour lands. To obtain the best results from the lime a dressing of manure should be given some little time after the lime had been applied. Lime had a tendency to strike downwards, so that it was not advisable to plough it into the land. In the discussion that followed, Mr. J. Burke doubted if the top dressing of pastures was a payable proposition. The Hon. Secretary (Mr. P. H. Dow) supported the views of the writer, and said that during last winter manured land on his property carried one ewe and lamb to the acre, while land immediately adjoining, and not manured, carried one dry sheep to three acres.

#### NARACOORTE (Average annual rainfall, 22.60in.).

March 11.—Present: 17 members.

**BOOKKEEPING ON THE FARM.**—Mr. A. C. DeGaris read the following paper:—  
 “In these days of ever-increasing taxation it is essential that the farmer should be an expert not only in the growing of crops and raising of stock, but also in keeping his financial accounts. An erroneous idea seems to be current that a farmer is not a business man in the generally accepted term. But the farmer is a business man, and he should strive to remember that, and conduct the business of his farm with the same thoroughness as the successful merchant or any other business man. In all businesses there comes the time of balance when the whole field of operations are reviewed, branches that do not pay are reorganised or discontinued, and those that pay are pushed forward. The same principle should be employed by the farmer. In some cases it is, but the great majority of farmers have no set system to which they can refer to find out what are and what are not the profitable branches of their farm. It is wise that all business men should at least once a year make a balance-sheet. It shows just what result the year's operations have had and whether or not sufficient profit has been made for the amount of capital employed. In making this balance-sheet everything in connection with the farm should be taken into account—on the one side the assets and the other the liabilities. There is no doubt if this was done regularly each year, farmers would be able to see the source of their income, and also what were the profitable concerns on the farm. It is practically impossible to give a set system of bookkeeping for the farmer, because the various branches of a farm are so varied; but a well-bound book should be kept, and in it should be entered the various operations of the farm each under its own heading. In case of cultivation, for instance, the area sown, the method of preparation of the soil, the class and quantity of seed and manures used, treatment of the crop during the growing stages, and the final return and other facts, such as cost of harvesting, should be recorded. It will readily be seen that while such a record would be of little interest for one year, a collection of such records would be of immense value to the thoughtful farmer; but there are minor things on the farm that should be carefully recorded. It is generally admitted that it takes no more feed to feed a good animal than a bad one. On many farms, for instance, we find dairy cows that are not worth paddock room. A little bookkeeping here again might be of great value. A slate could be hung in the cowyard, on which could be recorded the weight of each cow's milk over a milking period. In this way the drones, so to speak, would be found out, and could be fattened, and sold for beef, and the effect of this on the herd will be of



a beneficial nature. The same principle can be applied to all stock on the farm; even the fowls should be of the most profitable type. While this is all right in theory, it may not be altogether practicable, but a system of bookkeeping for the compiling of income tax returns is essential. It is quite unnecessary for me to enlarge on a system of books to be kept. There are several splendid books which can be bought, and if they are kept, no one should have any trouble in filling in their income returns. The trouble is that most farmers forget about their books until they see a notice in the papers that returns are due." A good discussion followed the reading of the paper. In connection with the farmer finding out his most profitable crops by a system of bookkeeping or recording all operations, Mr. DeGaris mentioned the great impetus super had given in the yield of crops, and the farmer, by keeping correct data from year to year of the quantity used per acre and the yields received, could be guided as to the quantity to apply. Mr. C. Drake mentioned that he had known of 30bush. per acre being taken off land without super; at the present time the same land would yield practically nothing without super. Mr. M. Beaton said it was remarkable that land that produced good crops previously without super would not now produce a good crop without super. He referred to land where super was regularly used. He thought it was due to the use of seed raised by super; if they used seed on it that was not raised on super land the yield would be as good as hitherto. Mr. W. E. Rogers said it was difficult for the farmer to keep any system of bookkeeping. They felt disinclined to settle down and make entries when they arrived home at night. Mr. R. E. Fisher thought that why only poor crops could be secured without super was due to the deterioration of the land by constant cropping and grazing. The depredations of rabbits also did much to impoverish the land. Mr. A. Caldwell said that the keeping of records would be beneficial to the farmer as a guide. He thought a system of bookkeeping was necessary as the basis for making out returns.

#### RENDELSHAM.

March 8th.—Present: 18 members.

**MAKING FARM LIFE ATTRACTIVE.**—A lengthy discussion took place on this subject. Mr. S. Smith said the main cause why so many farms were dull and unattractive was because of the lack of sufficient time and capital to improve and make the farm up-to-date and attractive. Many unestablished farmers were called upon to endure severe hardships, and they did not have time to make their home a place of comfort and attraction. Mr. V. Smith thought farm life would be more congenial to the laborer if the farmer, besides paying a fair wage, also gave his permanent farm hands a percentage of the profits derived from the holding. Mr. H. A. Stewart thought that if more opportunities were afforded for recreation the young people would be more contented on the farm.

#### RENDELSHAM.

April 12th.—Present: 13 members.

**FRUIT GROWING.**—Mr. H. A. Stewart exhibited 11 different varieties of apples, and taking each variety in order, explained their qualities in regard to eating, keeping, and culinary purposes. He stated he had 24 varieties of apples on his property, all growing on black peat soil, but the following were best suited for that class of ground:—Rome Beauty, Rokewood, Garibaldi, Spitzbergen, Lord Wolsley, Sturmer Pippin, Prince Bismark, Annie Elizabeth, Emperor Alexandria, and Cleopatra. He advocated having every variety of fruit it was possible to grow, in order to always have one class of fruit ripening throughout the whole of the year. He thought that one tree each of mulberry and quince and two or three of each pears, peaches, apricots, and plums should meet the needs of most of the farmers in their district. Grapes of the earlier varieties, such as Sweetwaters, he considered the best yielders in that locality. A breakwind was most essential, and for the purpose he favored pines, but they should not be planted less than 50ft. from the orchard. Mr. R. Foster also gave a short and interesting address on the

same subject. He believed that apples would grow well on practically any of the soils in the South-East. Peaches only gave good returns for a few years when planted in peaty land. They would do very much better if planted on sandy slopes. If the orchard was to be a success it was necessary that the land should be thoroughly ploughed and cultivated before the trees were set out.

TATIARA (Average annual rainfall, 19in.).

March 25th.—Present: 14 members and two visitors.

Mr. R. Hunt contributed a paper on "Telephones for Rural Districts," in which he dealt with the difficulties of the early settlers, compared with the modern inventions of to-day. He emphasised the tendency of the rural population to gravitate towards the cities in search of conveniences and refinements, and pointed out the convenience the telephone would be in the outback homes.

TATIARA (Average annual rainfall, 19in.).

April 22nd.—Present: 11 members.

DESTRUCTION OF STINKWORT.—In the course of a paper under this title, Mr. W. Campbell said stinkwort could be classed as one of the most useless and cumbersome weeds with which farmers had to contend, although it had one redeeming feature, in that, being a summer weed, it did not interfere with the different crops when growing, but it was a great nuisance at seeding time, when it made a rank growth and had a tendency to choke the implements at work, and also spoil the seedbed. It was sometimes stated that stinkwort was good feed for sheep, but in all his experiences he had never found it any good as fodder. Sheep that had come from a paddock where there was none of the weed, when first turned amongst it would nip it for a time, but they soon tired of it, and he thought that if there was nothing else to eat in the paddock, the stock would starve. Stinkwort when in bloom had been known in many cases to kill ewes which were in lamb. Referring to methods of destroying the weed, the speaker said a very light fire would kill stinkwort. One had only to have enough dry grass in the paddock to carry a fire through the weed, and most of the plants would be destroyed. Care should, however, be taken to burn before the seed of the plant was ripe. Stinkwort could also be killed by the plough or cultivation. Of course, that would sometimes mean working the fallow whilst it was dry, but it frequently happened that sufficient rain was received in the summer months for working the land. Stinkwort began to germinate during November and December, and could be destroyed more easily in those two months, before the plant had had time to become too deeply rooted. An interesting discussion followed. The question of arranging for a local trial of tractors was also discussed.

GLENCOE, February 17th.—Mr. J. L. Campbell contributed a paper entitled "Trade and Finance." An interesting discussion followed, in the course of which Mr. Campbell replied to a number of questions.

KALANGADOO, March 25th.—A lengthy discussion took place on proposed scheme to settle a million farmers on a million farms. Other subjects of local interest were also brought before the meeting.

MILLICENT, February 4th.—The report of the local experimental plots was read. Owing to the great amount of damage by grubs the tests had proved of very little value. The hay crop was a very heavy one, but had to be cut when very green, on account of the grubs. Mr. Mullins referred to the sparrow pest. He thought farmers should endeavor to keep the birds in check by poisoning them. A discussion then took place on the advantages of changing barley seed. Mr. Bell

was of the opinion that a change of land was almost as good as the use of new seed. At a subsequent meeting, held on March 4th, a discussion took place on the value of local experimental work, and it was decided to continue the experiments with several varieties of barley from imported seed.

**MOORAK**, April 7th.—Several matters, including the forthcoming Conference of South-Eastern Branches of the Agricultural Bureau, the appointment of nominees for the Roseworthy Agricultural College Winter School, and the proposed formation of a local herd-testing society, were brought forward for discussion.

**MOUNT GAMBIER**, April 9th.—Mr. H. H. Orchard (Orchard Inspector for the South-East) read a paper, "Pruning: Its Principles and Advantages." Matters in connection with the forthcoming Conference of South-Eastern Branches were brought forward and discussed.

**PENOLA**, April 1st.—Mr. G. Yeates contributed a paper, "Improving Inferior Lands," and a profitable discussion followed.

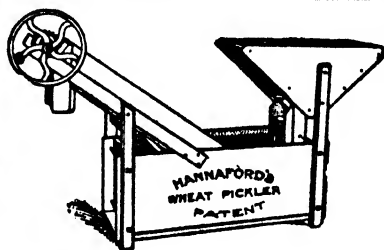
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# THE JOURNAL

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**All communications to be addressed:**

**"The Editor, Journal of Agriculture, Victoria Square, Adelaide."**

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T. PASCOE,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### Agricultural Bureau Conferences.

During the month of August three important Conferences will be held under the auspices of the Agricultural Bureau of South Australia. On August 3rd delegates representing Branches situated in the Upper Northern district will meet at Orroroo. On August 15th representatives of the Branches situated along the Pinnaroo line of railway will meet at Pinnaroo, and in the fourth week of the same month a gathering will take place at Cleve, to which Branches in the vicinity of Franklin Harbor have been invited to send delegates.

---

### Stinkwort.

Stinkwort (*Inula graveolens*) does not appear to injuriously affect land for wheatgrowing, and in many of the wheat-growing districts of the State it has been a very common weed for a long time now. It is probable that, because of its very deep-rooting habit, it has a beneficial, rather than a deleterious, effect on the soil, insofar as the growing of cereals is concerned. Any ill effects it may have on a succeeding wheat crop, says the Superintendent of Experimental Work (Mr. W. J. Spafford), are likely to be due to the fact that it is only a slowly decaying plant when ploughed into the land, and so creates difficulty in working the soil into the good condition necessary for successful wheatgrowing.

---

### Herd Testing at Moorak.

At a meeting of dairymen held recently at Moorak, it was decided to establish a herd testing society, under the conditions set out in the regulations governing the award of Government subsidies and prizes to herd testing societies. A canvass of the district for the purpose of enrolling members has been undertaken, and it is proposed to commence operations on July 1st.

---

### Oats as a Second Crop.

Advising a farmer in a mallee district, the Superintendent of Experimental Work (Mr. W. J. Spafford) recommended the following practice in cases in which it was intended to grow oats as a second crop after wheat:—Burn the wheat stubble as soon as possible. Immediately plough, or otherwise thoroughly cultivate the land, at a depth not greater than 2in. If rain falls between the ploughing and seeding, or weeds become troublesome, cultivate or harrow. Seed the land with 2bush. oats and  $\frac{1}{2}$ wt. to 1wt. superphosphate per acre before the end of April. If possible, harrow before and after the drill. If for any reason the "stubble" land has to be ploughed to a greater depth than 3in., it should be rolled to pack it together—which is not quite practicable in stumpy land—or it should not be seeded until after a heavy rain, and as the first heavy rain is sometimes delayed until well into the seeding season, it is not always wise to sow oats on deeply ploughed stubble land. The correct order of seeding for cereals is:—(1) Oats; (2) late wheats, mid-season wheats, early wheats; (3) barleys, and, if

oats cannot be seeded by the middle of May, it is good practice to use another kind of cereal. This means if a sufficiently heavy rain does not fall before the middle of May, deeply ploughed stubble land should be left until after the wheat crops are all in, and then be sown with barley. When we have some "proved" varieties of early oats we will be able to extend the seeding period for oats, but with the varieties now usually grown—Algerian and Calcutta—crops are not ensured unless the seed is put into the soil early in the season. Seeding oats after the middle of May is a gamble.

#### **Pocket Year Book.**

A copy of the sixth issue of the Statesman's Pocket Year Book of South Australia, containing statistical data relating to this State, has been received from the compiler, Mr. W. L. Johnston, Government Statist.

#### **Farm Equipment and Conveniences in U.S.A.**

Nearly every third farm in the United States had at least one automobile on the first day of last year. Of the 6,448,366 farms in the United States, 1,979,564, or 30.7 per cent., reported having automobiles to the number of 2,146,512. Motor trucks were reported on 131,551 farms in 1920, or about two farms out of every 100 in the United States as a whole. The number of motor trucks on these farms was 139,169. Three and six-tenths per cent. of the farms in the country were reported as having tractors on January 1st, 1920. This is about one farm out of every 28. The 229,334 farms thus represented had a total of 245,139 tractors. Telephones were reported on 2,508,002 farms, or 38.9 per cent. of all farms in the United States, in 1920. More than one-half of the farms in 14 States had telephones. Farms reporting water piped into the house in 1920 numbered 644,088, or about one farm out of every 10. The percentage was highest in the New England States and in California. Gas or electric light was reported on 452,809 farms, or 7 per cent. of all farms in the United States. These figures, gathered by the Bureau of the Census, are being studied by the United States Department of Agriculture in connection with its work along these lines.

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## INQUIRY DEPARTMENT.

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Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[ Replies supplied by F. MURRAY JONES, B.V.Sc., M.R.C.V.S., Assistant Government Veterinary Surgeon.]

"M. H.," Leighton, has dog recently recovered from distemper, but now has sores on both sides of the jaws.

Reply—The disease has left behind a nervous disorder known as chorea. Try the following:—Iodide of potassium,  $1\frac{1}{2}$  drams; bromide of potassium,  $1\frac{1}{2}$  drams; Fowler's sol. arsenic,  $\frac{1}{2}$  dram; water, to 6ozs.; one teaspoonful in milk three times a day.

"P. L. M.," Carrieton, reports cow with round, hard lumps in the udder. The milk after standing for 48 hours has a crimson tinge.

Reply—Any lumpy condition in the udder should be regarded as unsatisfactory. From your description I think your animal is suffering from a condition of chronic nodular mammitis. The blood in the milk is due to some of the small vessels breaking in the teat canal. There is no cure for the lumps.

"L. S. P.," Geranium, has horse that has been kicked in the head. When the horse breathes the bone in the head can be observed working in and out. Breathing is labored.

Reply—The difficult breathing is due to pressure from depressed bone. Surgical treatment is the only thing to be done with a view of raising the bone. You can remove hair over part and place a small pitch plaster over the injured area. There is no reason why he should not work later on.

"J. J. D.," Crystal Brook, has aged gelding with dry, distressing cough and discharge issuing from the nostrils.

Reply—The following treatment is recommended:— $\frac{1}{2}$  dram powdered extract aconite, 6 drams antimony potassium tartrate, 2ozs. powdered anisi; divide into six powders, and give one each night in feed. For the nasal discharge, steam with nosebag, into which has been placed 2ozs. eucalyptus, 1oz. turpentine; pour on to handful straw, afterwards add 1 pint boiling water. Steam for 15mins.

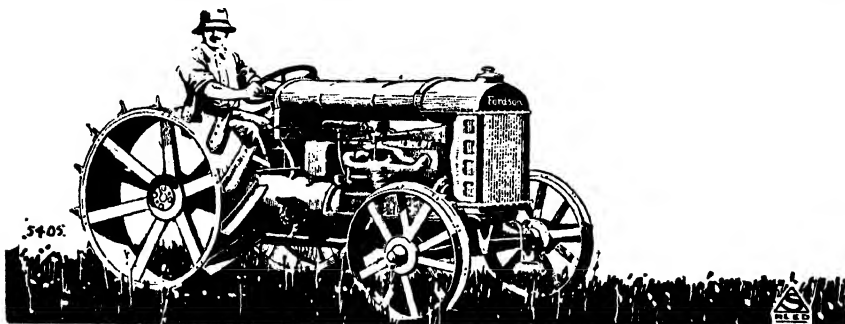
"H. B.," Binnun, has horse with large swelling on the hock following an injury.

Reply—From your description it seems to suggest the trouble is one of spavin. Try the application of the following blister:—One part red iodide of mercury, eight parts lanoline; rub in well for 15mins. Twenty-four hours later apply a smear of vaseline over the part.

"Farmer," Rowland's Flat, has horse horned in the side by a cow. Wound is discharging digested food.

Reply—The horse has what is known as a bowel fistula, or opening through the outer muscle walls of the abdomen and the wall of the intestines. Possibly an adhesion has taken place between the intestines and belly walls. Surgical





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treatment is the only relief. This would entail suturing the opening in the bowel and then the opening in belly wall. Whilst food is escaping no union will be effected.

"J. J.," Ramco, reports aged cow badly affected with scours.

Reply—Constant scouring in aged cows is sometimes due to presence of parasites in the bowel wall. However, try the following:—Chlorodyne, 1oz.; lime water, 1 pint; raw linseed oil, 1 pint.

"M. P.," Block E, Renmark, has horse whose legs become swollen whilst standing in the stable over night. Animal has previously had greasy heels.

Reply—Try the following:—Carefully trim hair from the part. Wash well with washing soda solution to remove any dry scale or crusts. Dry thoroughly with handful of dry bran. Apply zinc oxide ointment to part afterwards. Keep as dry as possible.

"C. L. B.," Karoonda, reports horse with large lump on the wither. The swelling is discharging matter.

Reply—Your animal has a fistulous wither. The only treatment is that of a surgical character; afterwards free irrigation with an antiseptic solution. The important point is that you must establish drainage for the pus through the bottom, otherwise treatment is useless. Pass a knife through from the top opening to a point situated at the lower part of the swelling and at the side sufficiently large so that the pus can drain away. Keep the wound open by passing a seton tape through. Irrigate at first with solution of washing soda, and follow up with free and copious irrigation of weak lysol or other available disinfectant. These are very difficult to treat, even under the most favorable conditions.

"W. J. E.," Wepar, has heifer four months in milk with obstruction in one teat.

Reply—Obstructions may be due to calculi or warty growths formed in the lining membrane of this teat. In the first case the obstruction is harder than the latter and is movable; the latter case is only slightly movable, depending on the elasticity of its attachment. Treatment in the former case is by dilating the teat tube with a teat dilator. In the latter case surgical treatment is the only treatment, the growth being severed by a surgical wire and removed. This is done when the animal is dry. If difficult to milk, you must use a teat tube whilst milking. Great care is required in inserting it, and it must be kept scrupulously clean.

"J. F.," Georgetown, has eight-year-old gelding with chronic swelling hind leg.

Reply—The application of a blister may serve a useful purpose. Try the following:—Red iodide of mercury, 1 part; lanoline, 8 parts; rub in well for 15mins. Avoid the bend of the joints.

"O. W. J.," Maitland, has filly foal, weaned six weeks, on good feed, but fails to put on condition.

Reply—Arrange to feed her by herself. Feed with oatens chaff and cupful of linseed jelly once a day. Linseed cake may be fed broken up in the feeder in the place of the jelly. A good lick next to rock salt is as follows:—Salt, 20 parts; sulphate iron, 1 part; sulphur, 1 part; mix. Make available to animals.

"A. G. T.," Glencoe West, reports aged draught mare with chronic slobbers.

Reply—Slobbering may be caused by foreign bodies wedged between the teeth, injury to the jaw from the bit, also drugs and digestive disturbances. I advise you to examine the mouth carefully for any of the above causes. Wash mouth out with cold water and alum.

Hon. Secretary, Agricultural Bureau, Morchard, reports death of ewes few days prior to lambing. Symptoms:—Weakness in hindquarters, lying down with head facing flank, and slobbering.

Reply—Sheep are not known to suffer from the condition popularly known as dry bible. They do, however, suffer from forms of impaction. In the cases mentioned death was probably due to lack of nutritious properties in food supply. Frequently this results in inflammatory changes in the bowels, or even paralysis.

When inflammatory symptoms show, give 4ozs. to 6ozs. castor oil with 2 drams laudanum, or if paralysis only a tablespoonful of whisky with 3ozs. of treacle. Drench with gruel, oatmeal gruel, and diluted cow's milk.

Hon. Secretary, Agricultural Bureau, Monarto South, seeks cure for three-year-old filly with strangles.

Reply—Occasionally the breathing is affected after an attack of strangles, but tends to disappear as the animal improves in condition. Good food, tonics. Steam the head with nosebag containing 2ozs. turpentine or eucalyptus, upon which has been poured 1 pint of boiling water. Place a handful of straw in nosebag first, and pour turpentine and water afterwards.

### IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC.

During the month of April, 1922, 14,414bush. of bananas, 1,201bush. of apples, 2,053bush. of peaches, 406bush. of pineapples, 166bush. of passion fruit, 47 packages of seeds, 18 packages of plants, 32 packages of bulbs, 20,943 bags of potatoes, and 1,982 empty wine casks were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910. Of these, 276bush. of bananas (over-ripe) were destroyed, 114 empty wine casks were fumigated, and 2,053 empty cases (second-hand) were returned to State of origin.

Under the Federal Commerce Act, 21,345 packages of fresh fruit and 35,795 packages of dried fruit were exported to oversea markets. These were consigned as follows:—To London—19,388bush. of apples, 1,896 packages of pears, 26,553 packages of dried fruit. To South Africa—3,278 packages of dried fruit. To New Zealand—3,880 packages of dried fruit, 41 packages of grapes. To United States of America—2,000 packages of dried fruit. To India and East—84 packages of dried fruit, 20 packages of apples.

Under the Federal Quarantine Act, 1,687 packages of seeds, &c., were examined and admitted from oversea sources.

#### *Interstate Imports.—Examined at Mount Gambier, April, 1922.*

	Packages.	Bushels.
Bananas . . . . .	82	123
Pineapples . . . . .	6	9
Apples . . . . .	689	689
Pears . . . . .	11	11
Passion fruit . . . . .	2	2
Peanuts . . . . .	4	—
Almonds . . . . .	1	—
Brazil nuts . . . . .	1	—
Grapes . . . . .	2	2
Cabbages . . . . .	70	—
Cauliflowers . . . . .	16	—
Grass roots . . . . .	3	—

Of these,  $\frac{3}{4}$  case of bananas and  $\frac{1}{2}$  case of pineapples (over-ripe), 2bush. of grapes (prohibited entry), and 3 second-hand cases were destroyed.

## DEPARTMENTAL DOINGS.

### GENERAL AGRICULTURE, ETC.

During May the Director of Agriculture (Professor Arthur J. Perkins) attended the Conference of River Murray Branches of the Agricultural Bureau, held at Berri. The Director also attended the Conference of Ministers of Agriculture, held in Perth.

Mr. A. M. Dawkins (member Advisory Board) visited Virginia Branch of the Agricultural Bureau, and delivered an address, "Diseases of Wheat."

The Inspector for Mallee Lands (Mr. C. P. Hodge) visited the following centres:—Wilkawatt, Claypan Bore, and Geranium, where he addressed the local Branches of the Agricultural Bureau, and, in addition, at the last named, visited various farmers in the district. Mr. Hodge also addressed meetings at Collie and Koppio, on Eyre Peninsula; in the former-named place he spent a week visiting and advising settlers.

### DAIRYING.

The Assistant Dairy Expert (Mr. H. J. Apps) visited dairies and factories in the following centres:—Bolivar, Balaklava, Saddleworth, Blakiston, Mount Barker, and Murray Bridge, and delivered lectures to the students of the High Schools at Murray Bridge and Mount Barker.

### POULTRY.

During the past month Mr. D. F. Laurie (Poultry Expert) visited and advised poultry breeders in the vicinity of Gawler and Onctree Hill.

### HORTICULTURE.

The Horticultural Instructor (Mr. Geo. Quinn) attended the annual meeting of the Australian Pomological Committee and the Australasian Fruitgrowers' Conference, held in Adelaide during the past month, and visited Inglewood and the Blackwood Experimental Orchard, in company with the visiting interstate horticultural officers and delegates. At the request of the fruitgrowers of this State, Mr. Quinn visited Melbourne, and acted as adviser at a conference of fruitgrowers. The conference dealt with the classification of plums and prunes for dried fruit purposes, and had for its object the formation of a fruitgrowers' association, to be affiliated with the Australian Dried Fruits Association. Mr. Quinn took to the conference a number of photographs and samples of fruit from the Blackwood Experimental Orchard, and these very materially assisted in deciding the correct names of varieties grown in South Australia and the other States.

The Horticultural Instructor for the Southern District (Mr. C. H. Beaumont) visited Narrung on May 6th, giving a pruning demonstration and address on drying and preserving fruit, and on May 8th, at Loveday Bay, an address on "Fruit Tree Planting on Narrung Peninsula."

## RANDOM AGRICULTURAL JOTTINGS.

[By ARTHUR J. PERKINS, Director of Agriculture.]

I have been asked why within recent years our f.a.q. wheat sample should have been appreciably lower than in earlier times. After careful consideration of the matter I have come to the somewhat unexpected conclusion that to a great extent responsibility rests with our more general adoption of improved farming practices. I am quite aware, of course, that apart altogether from this aspect of the question, the complete harvester must take its share of blame: in the main it does not deliver a sample of wheat of as high a bushel weight as does the average stripper heap, after careful winnowing. I am satisfied, however, that other factors of perhaps greater weight can be shown to have been at work in the same direction. Let us consider the available evidence.

\* \* \* \* \*

The practice of disposing of our wheat, both locally and abroad, on a fluctuating f.a.q. sample has been in vogue since 1887, and whilst it may be admitted that in the main yearly fluctuations are governed by purely seasonal influences, at the same time if it be true that special factors are at work tending to depress the f.a.q. standard, then their special influence must become apparent if we consider these fluctuations, not from the point of view of individual seasons, but from that of successive periods of years of equal value. If these periods are of sufficient length, individual seasonal influences may be assumed to have been more or less completely neutralised. In this connection, between the inception of the f.a.q. system in 1881 down to the 1921-22 harvest extends a period of 35 years, which admits of subdivision into five sub-periods of seven years each. Let us now see how both mean acre yields and mean f.a.q. samples have fared over these five septennial periods.

Septennial Periods.	Wheat Yields per Acre.		F.A.Q. Weights.	
	Means. Bush.	Increase or Decrease. Bush.	Means. Lbs.	Increase or Decrease. Lbs.
1887-1893 .. .. .	6.46	—	63.1	—
1894-1900 .. .. .	4.12	-2.34	62.8	-0.3
1901-1907 .. .. .	7.89	+3.77	62.6	-0.2
1908-1914 .. .. .	9.26	+1.37	61.9	-0.7
1915-1921 .. .. .	12.42	+3.16	61.2	-0.7
* * * * *				

Now, in the first place, there can be no question as to the progressive decline of our f.a.q. sample since the 1887-1893 septennial, a decline which has been particularly marked since 1908. The total value of this decline is equivalent to about 2lbs. to the bushel: and if, as in earlier times, we assume a dock of 1d. for each pound below standard, it would represent to producers on a 30,000,000bush. harvest, a loss of about a quarter of a million sterling per annum.

But, if the bushel weight has declined appreciably, mean acre yields, on the other hand, have risen very considerably—to the extent of 100

per cent. relatively to the first septennial period, and 150 per cent. relatively to the second. Nobody, I assume, would be prepared to deny that this enormous improvement in our average acre yields is the natural consequence of the more general adoption of progressive farming practices. What was once practised by the elect is to-day more or less common property, freely availed of by all those able to do so. Indeed, from some points of view, it is unquestionable that to-day we are at a disadvantage relatively to earlier farming periods. The virgin fertility of the soil has been skimmed; the area under cultivation has vastly increased; we have been forced to take in vast tracts of poor land, which our predecessors would have looked upon as unfit for cultivation; and, moreover, the bulk of this land is as yet only partially reclaimed, and therefore much below maximum production. But, these various handicaps notwithstanding, our mean acre yields have risen very remarkably, because, as has already been said, our general farming is better: we till our land better, use manures more judiciously, avail ourselves of better varieties of grain, &c., &c.

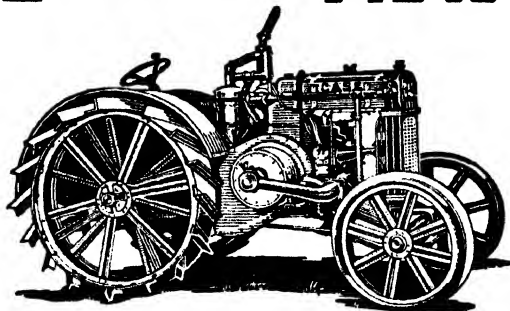
\* \* \* \* \*

Unfortunately all these practices which have led to higher yields would appear concurrently to have exercised a depressing influence on our mean bushel weight. If in this connection we examine closely into the chief factors which usually affect the mean bushel weight of a crop, we shall realise that this could not very well have been otherwise.

Anybody who has had very slight experience of wheatgrowing will know that weather conditions affect the quality or the bushel weight of grain very appreciably. There are, for instance, what may be termed "hay" years as distinct from "grain" years; and in the former the bushel weight is generally low, although grain yields may be normal or even above normal. I have a very clear recollection of three seasons over which it would have been difficult to improve upon weather conditions from the point of view of wheat: 1905-6, with f.a.q. at 63; and 1908-9 and 1909-10, with f.a.q. at 62½: unfavorable seasons will be within the recollection of all.

On the other hand, any other factor, seasonal or cultural, which leads to rankness of growth tends ultimately to relatively light grain, although not necessarily to low yields. Mild, frostless winters contribute much towards this condition of affairs, giving rise, as they do, to soft, sappy growth unable to withstand the first breath of summer weather. Premature sowing, too, of early ripening varieties gives rise to similar troubles in almost any season. A short, dry spring, followed on by an unusually early summer, does not lead to rankness, but by shortening the growing period of the crop frequently leads to low bushel weights. Similarly, cultural operations which stimulate vegetative growth unduly do so as a rule at the expense of the quality of the grain, and sometimes at the expense of its yield. Excessive manuring, for instance, particularly if nitrogenous in character, will usually depress the bushel weight more or less. Again, it is approximately true that, other things being equal, the bushel weight of most varieties is inversely proportional to their yielding capacities, or, in other words, high yielding varieties usually show a tendency towards relatively light grain, and vice versa. Then there is the chapter of accidents to be

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One of our representatives was asked whether the Case Tractor was economical. Other farmers may be asking the same question, so we give the answer in this letter received from a farmer.

### *Here's what he says:*

Dear Sirs,

Paninya, Victoria,

April 18th, 1922.

In reference to 15/27 Tractor, which you started for me, I must say that I am well satisfied with tractor and its performance. I am working a combination drill and harrows at present with the tractor, with which I can average 30 acres a day easy. The fuel consumption is very light, 3 pints of kerosene per acre and about 2 pints of lubricating oil per day.

As the above performance includes some heavy sand-hills, I think it is very satisfactory, and I feel sure that the tractor will satisfy my requirements.

Yours faithfully (Sgd.) R. BERLIN.

We have other letters covering other conditions and classes of farm work. Let us send you these as further proof of our claim that the "CASE" is the Tractor of the world.

*Remember, the figures we give are not merely assertions, but actually what the farmer says of the work done by the CASE Tractor on his own farm.*

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taken into account. A wet summer is never favorable to high bushel weights, and when, as has happened in recent years, the wet weather extends into harvest time, a low bushel average is unavoidable. The influence of red rust in this direction is too well known to need stressing.

\* \* \* \* \*

Finally, if we look at the question in its broadest possible aspect, we shall probably admit that the ultimate aim of improved farming practices is towards securing the highest yields possible compatible with quality that is reasonably marketable; that is to say, we believe in quality, but believe in quantity with greater conviction. And under existing economic conditions there is nobody who can say that we are not right from the individual viewpoint: whether we are so collectively or not, is a moot point. It seems certain that the value of our wheat on the markets of the world, and consequently the prices that can be offered to us individually, will be governed very largely by what is known to be the mean value of our bushel weight relatively to that of other countries: if it is above the average we shall benefit, if below we shall suffer. This is an argument in favor of putting on the market the best possible sample that we can produce—an argument in favor of additional cleaning, but not an argument in favor of depressing our yields. We cannot afford to aim at anything less than high yields, however much the bushel weight may be depressed thereby; but we can afford to place on the market a cleaner, and therefore a heavier sample, providing we can see some return for our additional labor. But so long as the man who markets directly from his complete harvester can command as good a price as the man who goes to the trouble of winnowing his wheat, no farmer can be expected to aim at a high bushel weight. If "docks" for weights below standard are legitimate, then surely premiums for weights above should be their counterpart, and without them no improvement in our present market samples can be anticipated. Fortunately, with the adoption of bulk handling all these difficulties will disappear, including the f.a.q. sample itself.

\* \* \* \* \*

In this connection some results from the Roseworthy Agricultural College permanent plots will bear quoting. These plots have been in existence since 1905, and cover, therefore, a period of 17 years. If for purposes of comparison we take a permanently unmanured plot and a plot treated yearly with 2cwts. of superphosphate, and calculate the returns for the last two septennial periods, namely, 1908-1914 and 1915-1921, we secure the following results:—

Means per Acre per Annum.	1908-1914.		1915-1921.	
	Permanently Unmanured.	2cwts. Super- phosphate.	Permanently Unmanured.	2cwts. Super- phosphate.
Grain yield . . . .	13.79bush.	19.86bush.	14.95bush.	21.1bush.
	T. c. lbs.	T. c. lbs.	T. c. lbs.	T. c. lbs.
Total produce . . .	1 4 67	1 15 27	1 7 20	1 14 59
Straw to 60lbs. grain	139.8lbs.	138.7lbs.	143.6lbs.	123.3lbs.
Bushel weight . . .	63.2lbs.	63.5lbs.	62.1lbs.	61.8lbs.
Means . . . . .	63.3		61.9	



We see then, that as with the State as a whole, so here at Roseworthy, on these two plots the mean yields for the 1915-1921 period were higher than those of the preceding septennial, and the mean bushel weights correspondingly lower. Let us recollect that we are not here dealing with imperfectly cleaned complete harvester samples, but with grain samples practically free from impurities, and it follows that bushel weight is an index of quality, apart altogether from the presence or absence of foreign matter. It is clear, therefore, that improved mean yields have again led to depression in the bushel weight. When, however, we come to compare the unmanured crop with the crop dressed with 2cwt. of superphosphate, we find only slight differences: in favor of the unmanured plot in one period and in that of the manured one in the other. A comparison of the relations between straw and grain shows that there was no appreciable rankness of growth in either case, and little cause, therefore, to affect the bushel weight unfavorably, one relatively to the other.

\* \* \* \* \*

I shall state, in conclusion, that in any given season the average bushel weight is very largely the final result of the influence of the season on the growing crop. Heavy crops and high bushel weights may go hand in hand providing favorable weather conditions obtain throughout the growing season. More generally, however, the conditions that lead to heavy crops pave the way for relatively light bushel weights. And if of late our f.a.q. samples have been lighter than in preceding periods, it is partly in response to the heavier yields which we have secured. At the same time, it is certain that the f.a.q. samples would have been higher had we found it worth our while to clean our market wheat more thoroughly than has generally been the case.

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**Arthur H. HASELL, PORT ADELAIDE,**  
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## ONE YEAR'S FOOD OF AN OWL NEAR ADELAIDE.

[By ARTHUR M. LEA, F.E.S., Consulting Entomologist to the Department.]

(Contribution from the South Australian Museum.)

At the present time when, on account of plague, so much attention is being paid to the destruction of rats and mice, it would seem opportune to call attention to the work being performed in this direction by one of our most persecuted birds, the screech owl or barn owl, technically known in England as *Strix flammea*, or *Flammea flammea*; the Australian variety as *Flammea delicatula*, or *Tyto alba delicatula*.

Owls are certainly not popular birds, their nocturnal habits, harsh notes (in the case of the screech owl sometimes like that of a child in agony), and general appearance are all against them. In England they are frequently shot by gamekeepers, who regard them as vermin. In South Australia they are protected throughout the year, and a fine, in addition to a penalty of £5 for each bird, is liable to be inflicted upon anyone convicted of destroying them; the eggs are also protected. Some time back Captain S. A. White brought under my notice some pellets of the screech owl, and it was easy to see with what certainty the food of that bird could be determined. As a matter of fact, much has been done in working out its food in other parts of the world, and particularly in England. Shortly afterwards Captain White published an article on the bird.\*

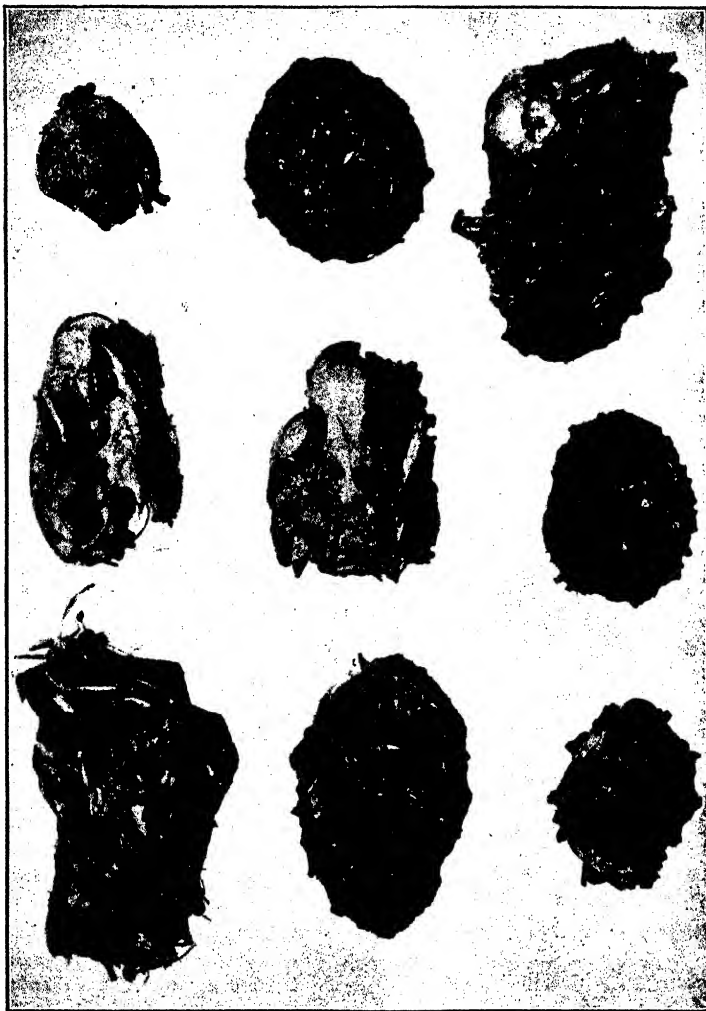
\* White, "The South Australian Ornithologist," 1915, p. 90.

To determine the food of birds, thousands have been shot in England and America, but in South Australia our bird population is so scanty that this is not desirable. With owls and a few other species of birds the waste parts of food, after it has been in the stomach sufficiently long, are ejected from the mouth as pellets or casts. The birds, shortly before ejecting them, rest for some time on trees, often on the same branch; birds in nests usually eject them in hollows of trees, where they sometimes accumulate in amazing numbers, but when exposed in the open the pellets gradually break up.

I am credibly informed that at least two pellets are thrown up by the screech owl each day; sometimes probably three, or even more, are thrown up, and rarely but one. A fair average throughout the year would appear to be two each 24 hours.

On the basis of two pellets a day, each bird would eject 730 in the course of a year. It was decided, therefore, to examine 730 pellets, to give a fair idea of one year's food of an owl. The method adopted for extracting the bone contents from the pellets was to place these separately in small jars of water for two or three days, then put each in a sieve, and a strong jet of water was played over it; in this way hair, feathers, small bones, and other non-essential parts were driven away, leaving all the bones that were necessary for identification.

Except for the larger insects (such as large night-flying moths, cockchafer beetles, and crickets) records were not usually made of the insect contents of pellets, as these in most cases were obviously from



Owl Pellets—Showing Rat, Mouse, Sparrow, Starling, and Frog Bones. Natural Size.

(H. M. Hale, Photo.)

the stomachs of the birds eaten (sparrows, starlings, &c.). Stomachs of sparrows were conspicuous features in many of the disintegrated pellets, and wheat and other seeds were often seen in them.

No remains of chickens or pigeons were seen in the pellets, and no bones of snakes were identified, although they were specially watched for.

The pellets examined were all obtained from Captain White, Fulham, and from Mr. J. W. Mellor, Lockleys, both places near Adelaide. In the former case probably from one owl only, in the latter probably from one family of owls only. Captain White prepared about 150 of them for examination. The pellets varied considerably in size, and were all entire, partly broken up ones being rejected, this being the only selection made. No doubt pellets from country districts would show different results, bones of our smaller marsupials and birds being contained in them.

The principal bone contents of the pellets were easily recognised, and were those of mice, rats, sparrows, starlings, and frogs. Of the less common birds, I am indebted to Dr. A. M. Morgan for the identification of their remains, mostly by heads and breast bones; Messrs. E. R. Waite and F. R. Zietz also identified some of the bones.



**Sparrow Heads.— From One Year's Food of an Owl.**

[H. M. Hale, Photo.]

Some of the bones of rats, mice, sparrows, and frogs had curious spongy swellings, considered by Dr. Morgan to be evidence of periostitis. The bones of each pellet were examined and noted separately, afterwards being listed under the mammals or birds, &c., or combinations of these, as follows:—

*Mice.*—Bones of one mouse were contained in each of seven pellets, of two mice in each of 69 pellets, of three in each of 82, of four in each of 64, of five in each of 32, of six in each of eight, of seven in each of five, and of eight in each of two pellets.

*Mice and Rats.*—Bones of one mouse and one rat were contained in each of 14 pellets, of one mouse and two rats in each of two pellets, of two mice and one rat in each of 22, of three mice and one rat in each of eight, of four mice and one rat in each of two, of six mice and one rat in one, and of eight mice and one rat in another.

*Mice and Bats.*—Bones of one mouse and one bat were contained in a pellet, and of two mice and one bat in each of two others.

*Mice and Sparrows.*—Bones of one mouse and one sparrow were contained in each of 28 pellets, of one mouse and two sparrows in each of 28 pellets, of one mouse and three sparrows in each of three, of two mice and one sparrow in each of 19, of two mice and two sparrows in each of nine, of three mice and one sparrow in each of 11, of four mice and one sparrow in each of two, of two mice and three sparrows, of three mice and two sparrows, and of four mice and two sparrows in others.

*Mice and Starlings.*—Bones of one mouse and of one starling were contained in each of three pellets, of one mouse and two starlings in one pellet, and of two mice and one starling in each of six pellets.

*Mice and Blackbirds.*—Bones of two mice and one blackbird were contained in each of two pellets, and of three mice and one blackbird in another.

*Mice and Little Water-Crakes.*—Bones of one mouse and one little water-crake were contained in each of two pellets, and of five mice and one crake in another.



Lower Jaws of Mice and Rats.—From One Year's Food of an Owl.

[H. M. Hale, Photo.]

*Mice and Frogs.*—Bones of one mouse and one frog, of one mouse and two frogs, of one mouse and three frogs, of one mouse and five frogs, of two mice and four frogs, of two mice and seven frogs, and of four mice and two frogs were contained in single pellets; of one mouse and seven frogs, of two mice and two frogs, of three mice and three frogs, and of four mice and three frogs in each of two pellets; of two mice and one frog in each of eight; of two mice and three frogs in each of three; of three mice and one frog in each of eight; of four mice and one frog in each of six; and of five mice and one frog in each of four pellets.

*Mice, Rats, and Sparrows.*—Bones of one mouse, one rat, and one sparrow were contained in each of three pellets, and of two mice, one rat, and one sparrow in each of two others.

*Mice, Rats, and Frogs.*—Bones of one mouse, one rat, and one frog, of two mice, one rat, and one frog, and of three mice, one rat, and one frog were contained in separate pellets.

*Mice, Sparrows, and Frogs.*—Bones of one mouse, one sparrow, and one frog were contained in each of four pellets; of two mice, one sparrow, and two frogs in each of two others; and of one mouse, one sparrow, and two frogs, of one mouse, two sparrows, and one frog, of one mouse, two sparrows, and two frogs, of two mice, one sparrow, and one frog, of three mice, one sparrow, and one frog, of four mice, one sparrow, and one frog were contained in separate pellets.

*Mice, Sparrows, and Lizards.*—Bones of one mouse, two sparrows, and one small lizard, and of two mice, one sparrow, and one small lizard were contained in separate pellets.

*Mice, Chestnut-eared Finches, and Frogs.*—Bones of five mice, one finch, and one frog, and of two mice, one finch, and one frog were contained in separate pellets.



Other Bones.—From One Year's Food of an Owl.

[H. M. Hale, Photo]

*Rats.*—Bones of one rat were contained in each of 44 pellets, of two in each of 16, and of three in each of six.

*Rats and Sparrows.*—Bones of one rat and one sparrow were contained in each of 10 pellets, and of one rat and two sparrows in another.

*Rats and Frogs.*—Bones of one rat and one frog were contained in each of two pellets, of one rat and two frogs, of one rat and four frogs, and of one rat and five frogs in others.

*Rabbits and Frogs.*—Bones of one young rabbit and of one frog were contained in each of three pellets.

*Sparrows.*—Bones of one sparrow were contained in each of 25 pellets, of two in each of 63, and of five in another.

*Sparrows and Frogs.*—Bones of one sparrow and one frog were contained in each of two pellets, of one sparrow and five frogs, of two sparrows and one frog, and of three sparrows and two frogs in others.

*Starlings.*—Bones of one starling were contained in each of eight pellets, and of two in another.

**Blackbirds.**—Bones of one blackbird were contained in each of three pellets.

**Frogs.**—Bones of four frogs were obtained in each of two pellets, of six in each of two, and of five in another.

**Miscellaneous Pellets.**—Bones of one mouse and one young rabbit were contained in one pellet; of three mice, one young rabbit, and one frog; of one mouse, one rat, and one frog; of one mouse, one rat, three sparrows, and one frog; of one mouse, one bat, and one sparrow; of one mouse, one bat, and six frogs; of one mouse, one starling, and one little water-crake; of two mice and one fly-catcher; of three mice and one grey shrike-thrush; of two mice, one grey shrike-thrush, and one bat; of four mice and one small bird; of one rat and one blackbird; of one rat and one New Holland honey-eater; of one bat and one starling; of one sparrow and one blackbird; of one sparrow, one goldfinch, and one frog; of one grass-bird and one small bird; and of one small bird and two frogs, in others. In one there were only remains of field crickets, this being the only pellet composed solely of insect remains.

#### SUMMARY AS FOR ONE YEAR'S FOOD OF AN OWL NEAR ADELAIDE.

Mammals—		Insects—	
Mice . . . . .	1,407	Large night-flying moths . .	25
Rats . . . . .	143	Field crickets ( <i>Gryllus ser-</i>	
Bats . . . . .	7	<i>villci</i> ) . . . . .	50
Young rabbits . . . . .	5	Mole cricket ( <i>Gryllotalpa</i>	
Birds—		<i>coarctata</i> ) . . . . .	1
Sparrows . . . . .	375	Carnivorous cricket ( <i>Gryllac-</i>	
Starlings . . . . .	23	<i>ris</i> sp.) . . . . .	1
Blackbirds . . . . .	8	Grasshopper . . . . .	1
Little water-crakes . . . . .	4	Katydid . . . . .	1
Chestnut-eared finches . . . . .	2	Cockroach . . . . .	1
Grey shrike-thrushes . . . . .	2	Mantes . . . . .	2
Goldfinch . . . . .	1	Large cockchafer beetles . .	2
Grass-bird ( <i>Cisticola exilis</i> )	1	Root beetle ( <i>Isodon peculiar-</i>	
Flycatcher ( <i>Microeca fasci-</i>		<i>ius</i> ) . . . . .	2
<i>cinans</i> ) . . . . .	1	Dung beetle ( <i>Onthophagus</i>	
New Holland honey-eater . .	1	<i>mniszechii</i> ) . . . . .	4
Unidentified small birds . .	4	<i>O. pentacanthus</i> . . . . .	2
Reptiles—		Night beetles ( <i>Bolboceras</i>	
Small lizards . . . . .	4	<i>spp.</i> ) . . . . .	13
Frogs . . . . .	174		

## GRAIN GROWERS!

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**WHEAT, OATS, BARLEY, PEAS, CHAFF, &c.,**

IT WILL PAY YOU TO GET IN TOUCH WITH

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**GRAIN AND PRODUCE MERCHANT,**

**CENTRAL MISSION BUILDINGS, ADELAIDE.**

## FRUIT TREE AND GRAPE VINES.

### PRUNING COMPETITIONS ON THE RIVER MURRAY SETTLEMENTS.

Following on the success which attended the initial effort in organising a series of fruit tree and grape vine competitions on the River Murray settlements last year, arrangements have now been made for a further series of competitions, to take place at:—Berri on Tuesday, June 13th; Waikerie, Tuesday, June 20th; Moorook, Wednesday, June 21st. The competitions will be divided into two (2) classes, namely, vine pruning and fruit tree pruning. In each case judging will be according to the scale of points set out below.

#### VINE PRUNING COMPETITIONS.

(1) In this class each competitor will be required to prune:—  
(a) Five vines of the Muscat Gordo Blanco type; (b) five vines of the Zante currant type; (c) five vines of the Sultana type.

(2) The first named (a) are to be pruned on the bush system.

(3) The second (b) are to be cordon or espalier spur pruned, at the discretion of the committee.

(4) The third named (c) are to be espalier rod and spur pruned.

(5) The competitors will be required to twist and secure the rods to the trellis wires in the case of the Sultana vines.

(6) The time to be allowed for each class will be determined by the various committees after examination of the vines and trees to be pruned in their respective districts. All competitors will be required to cease work on expiration of time allowed. The judges will be allowed to take points from competitors who have not completed their vines in the given time. This will be at the discretion of the judges. In the event of two (2) or more competitors gaining equal points in any one class, the competitor who finished his work first will be awarded the first prize.

(7) The judges will allot points to each competitor in accordance with the scale set out below:—

Type.	Division.	Points.
<b>Gordo—</b>		
	Selection of fruiting wood . . . . .	20
	Shaping of vines . . . . .	4
	Clean cutting . . . . .	6
<b>Currant—</b>		
	Selection of fruiting wood . . . . .	20
	Shaping of vines . . . . .	6
	Clean cutting . . . . .	4
<b>Sultana—</b>		
	Selection of fruiting wood . . . . .	12
	Twisting the canes . . . . .	12
	Shaping the vines . . . . .	12
	Clean cutting . . . . .	4



## FRUIT TREE PRUNING.

(1) The competitors will be required to prune one (or more at the discretion of the committee):—(a) Peach tree, (b) apricot tree, (c) pear tree.

(2) Time allowed for each class will be governed by the same conditions as for vines.

(3) Judges will allow points to each competitor in accordance with the scale set out below:—

Type.	Division.	Points.
Peach—		
	Selection and treatment of fruiting wood . . . . .	15
	Selection and treatment of leaders and shaping of tree . . . . .	15
	Clean cutting . . . . .	10
Apricot—		
	Selection and treatment of fruiting wood . . . . .	15
	Selection and treatment of leaders and shaping of tree . . . . .	10
	Clean cutting . . . . .	5
Pear—		
	Selection and treatment of fruiting wood . . . . .	12
	Selection and treatment of leaders and shaping of tree . . . . .	12
	Clean cutting . . . . .	6

## WAIKERIE.

In the event of it being found impossible to secure suitable bush vines in the Waikerie district, the committee will substitute espalier pruned Muscat Gordo Blanco or Doradillo vines in lieu thereof. This will apply in the Waikerie district competition only.

## CHAMPIONSHIP.

In addition to the district competitions referred to above, championship competitions will be held at Waikerie on Thursday, June 22nd. These championship events will be open to persons placed first, second, and third, respectively, in the district competitions, provided that each competitor in the championship competitions shall have secured an average minimum of 75 per cent. of the total marks awarded in the section for which he enters, and provided also, that he shall have gained a certificate (*i.e.*, 80 per cent. of the marks awarded) in two of the three sections in the district competitions.

## JUDGES.

The Manager of the Government Experimental Orchard at Berri (Mr. C. G. Savage) will undertake the duties of judge in all the competitions. He will have the assistance of two consultative judges, to be appointed by the local committee responsible for the competitions.

## TREATMENT OF YOUNG TREES AND VINES.

In addition to the competitions mentioned above, some of the Branches are including in their year's programme competitions for the treatment of two-year-old and three-year-old trees and vines.

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**CURRIE STREET, ADELAIDE.**

## **KYBYBOLITE EXPERIMENTAL FARM.**

### **HARVEST REPORT, 1921-1922.**

[By L. J. Cook, Manager.]

This farm is situated in the hundred of Binnum, in the south-east of the State, and contains about 1,000 acres of land, immediately surrounding the old Kybybolite sheep station. The land is slightly undulating, and varies considerably in texture, color, and composition. The great bulk of the soils consist of comparatively heavy and cementy loams, containing a large proportion of ironstone rubble, over stiff clays of varying depths, and much lacking in the element lime, whilst there is a fair amount of heavy working “crabhole” land.

#### **THE SEASON, 1921.**

The season was an average one, for not only did both the annual rainfall (22.49in.) and the useful rains (18.53in.) for the year very closely approximate the average totals recorded during the past 16

years, but they were also fairly well distributed, and except for two or three conditions would have been conducive to the production of high crop yields. As will be seen from the table accompanying, there was sufficient rain during January, February, and March to enable land to be ploughed and prepared for seeding, and although the actual seeding rains were light they were sufficient to ensure a good germination. The heavy winter rains also held off until late, so that comparatively large areas were able to be sown to crops. The rains, however, of the latter end of August and early September were heavy, and considerably checked the growth of crops where good drainage was not available. The extremely hot and unseasonable weather experienced during the latter part of October spoilt the grain yields for the season, resulting in a large bulk of growth with very poorly filled heads. Very heavy rains were recorded at the end of November, but these were too late to benefit cereal crops to any extent.

Further, no doubt on account of the more or less mild winter, caterpillars developed strongly, and attacked many crops of oats, peas, and linseed during the spring, and wrought much damage.

The following table sets out in detail the rainfall obtained at the farm since 1906:—

RAINFALL DISTRIBUTION AT KYBYBOLITE, 1906-21.

	Means, 1906- 1915.	1916.	1917.	1918.	1919.	1920.	1921.	Means, 1906- 1921.
January .....	0.37	1.29	0.45	0.29	0.16	0.08	1.07	0.44
February .....	0.93	0.28	2.81	0.23	2.35	0.07	0.88	0.99
March .....	1.53	0.03	1.17	0.27	0.84	0.98	0.63	1.20
April .....	1.50	2.07	0.74	1.38	0.06	0.38	0.62	1.26
May .....	2.52	0.69	4.72	2.48	2.09	2.85	1.72	2.49
June .....	3.14	3.56	1.33	3.52	1.53	4.31	2.16	2.99
July .....	3.13	2.68	4.47	2.42	2.21	3.04	3.03	3.07
August .....	2.67	2.94	2.69	2.76	1.08	4.29	3.55	2.75
September .....	2.96	2.77	2.96	0.53	2.53	2.44	2.97	2.74
October .....	1.80	2.20	2.78	2.70	1.64	0.98	1.24	1.85
November .....	1.55	3.28	2.21	0.65	0.29	0.91	3.24	1.63
December .....	1.21	1.74	0.36	1.09	0.82	0.54	1.38	1.13
Total rainfall .....	23.31	23.53	26.69	18.32	15.60	20.87	22.49	22.54
Total "Useful" rain (April-November).	19.27	20.19	21.90	16.44	11.43	19.20	18.53	18.78

In what we know as our "cereal" districts the yield of cereal crops can usually be estimated fairly reliably on the amount of rain which falls between April and November, and even then it is dependent, to a large extent, on the distribution of that rainfall over the period; but in the peculiar soil conditions of this farm, where the average annual

rainfall is comparatively good, the success of these crops depends wholly on the distribution of this "useful" rain. In the next table the distribution of the April to November rainfall is set out, and it shows light seeding and winter rains, with comparatively heavy spring and early summer ones. Under such a distribution cereals should thrive in the district, and had it not been for the extraordinary October conditions already mentioned, it is in every way evident that one of the most prosperous years for the district would have been recorded. It is significant that the seeding and winter rains of the season 1912 (the most productive season in the history of the farm) were identical with those of this one.

*Distribution of "Useful" Rain, Kybybolite, 1921.*

	1921.	Means. 1906-1921.
	In.	In.
Seeding rains (April-May) . . . . .	2.34	3.75
Winter rains (June-July) . . . . .	5.19	6.06
Spring rains (August-October) . . . . .	7.76	7.34
Early summer rains (November) . . . . .	3.24	1.63
Total "useful" rain . . . . .	18.53	18.78

CROPS.

The bulk of the crops grown were the cereals for green forage, hay, and grain, to be fed mainly to stock on the farm, together with other crops (principally leguminous and cruciferous) in rotation tests with cereals.

*Green Forage Crops.*—Advantage was taken of the February rain to break up hay stubble in Field No. 20 to a depth of 3in. to 4in. with the ploughs. Following the early March rain this field was rolled, drilled, and harrowed; 40lbs. oats, 30lbs. wheat, and 25lbs. barley seed, with 80lbs. superphosphate, was sown per acre. This germinated well, and made good early growth, so that our herd of young dairy stock was practically kept on the field throughout the winter months. A first short feeding was given in May, the second, a fairly heavy feeding, from June 15th to July 15th, and another feeding from August 2nd to August 29th. Fair sheep feed was afterwards obtained. In actual grazing figures, 0.44 cattle per acre were carried for the four months continuously, May to August, and the equivalent of 2.19 sheep per acre were carried for the whole year.

*Field No. 20E.*—The germination of kale in this field in the spring of 1920 failed, hence early in May, 1921, the following mixture of cereals was drilled per acre with 40lbs. super:—50lbs. rye, 20lbs. oats, and 25lbs. barley. The land was harrowed after drilling, and King Island melilotus was broadcasted at rate of 4lbs. seed per acre. This crop made very good growth during the winter months, especially the

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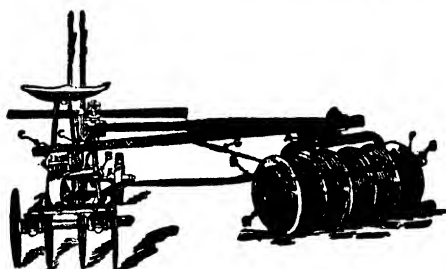
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rye and oats. The melilotus germinated well, but did not make much growth. As the soil was very soft and saturated, large stock had to be kept off it, and the feed was reserved for the spring lambing ewes. The bulk of the feed was used from August 18th until the close of September, when it carried 11 lambing ewes per acre. Altogether 674 feed days per acre were secured, which is equivalent to 1.85 sheep per acre per year.

*Crimson Clover*.—Field No. 6c in a six-course rotation came in for a grazing crop this year, and during February the hay stubble was disced over, the soil rolled and harrowed, and 10lbs. crimson clover seed was broadcasted per acre and rolled in. Very fair germination was secured, but plants did not at first develop quickly, but during September, October, and November very good dairy cow grazing was available. Calculating days as one for every sheep or every 100lbs. live weight of big stock depastured, from this crop 722 feed days per acre were secured, which is equivalent to 1.98 sheep per acre per year.

*Lucerne*.—The plot of this crop in Field No. 10, that was sown during 1918 and has never been irrigated, made quite a useful growth during the spring and early summer, two cuts of green feed being secured. Approximately, the first cut (during November) yielded 30cwts. per acre, and the second cut (close of December) gave 19cwts.; a total for the year, besides a little winter and late summer grazing, of 2 tons 9cwts. green lucerne per acre.

*Paspalum*.—The plants of this grass are now fairly well established in the 2-acre field, No. 9, and although the plants have lived healthily throughout the summer, they have not really thrived, and have produced little or no feed.

*Wimmera Rye Grass* (*Lolium subulatum*).—This grass again came well in Field No. 11A, and made quite a thick, healthy growth, showing clearly that when once well established, and not too heavily fed when the grass is heading, it will successfully maintain itself against such strong winter weeds as the Cape dandelion. This plot was used as a green feed run for young growing calves that were also a good deal hand fed, so that definite grazing figures are not available for this grass.

*Legume Fodders*.—These were tried in  $\frac{1}{4}$ -acre plots in Field No. 16A. We were not able to graze these, but the following notes were made on their growth:—Alsike clover made good germination and very fair growth, especially late in the spring, and warrants further trial. Lentils failed to germinate. Subterranean clover germinated well, and made very good growth, but went off rather quickly in the spring, considerably before Alsike clover. Trefoil clover practically a failure; only a few odd seeds germinating. Hairy vetch, poor germination, but some good plants produced.

*Bokhara, or Sweet Clover*, was tried in admixture with Italian rye grass in Field No. 9b, and although it made a poor start it made sufficient growth later in the season to warrant further trial.

*Annual Summer Fodders* (without irrigation).—Maize, amber cane, Sudan grass, and sunflowers were sown in Field No. 17 on some of our poorest soil during October, in rows 3ft. apart, after the soil had been well prepared. However, the summer proved altogether too dry, and after December these crops made little or no growth. Notes on each crop are as follows:—Maize (Hickory King variety) germinated well, but made very irregular growth; some good patches made up to 3ft. of growth. Sudan grass germinated fairly well, and kept growing the longest, clearly showing its drought-resistant capabilities; however, it gave only a comparatively small amount of feed. Amber cane was almost a complete failure, germinating poorly, and plants made very little show. Sunflowers made by far the best showing, germinating well, and making the quickest use of the moisture whilst it was available in the soil, and the best of them reached up to 5ft. in height. From 6 acres we were able to cut 14 tons of green feed for stack ensilage. They were sown at the rate of 7lbs. seed per acre, with 40lbs. bonedust.

*Turnips*.—Three fields, Nos. 6A, 4b, and 9F, were sown in the spring in the various rotations, and quite a satisfactory growth was secured. The plots were ploughed deeply during July, skim ploughed, rolled, and harrowed, and drilled with white mammoth turnips, 2lbs. seed and 40lbs. bonedust per acre, in rows 3ft. apart, during October 5th to October 11th. The seed was drilled very shallow, and was immediately covered by a light rolling. A really good germination was secured, and the turnips made a quick growth, utilising much of the late November rains, and made quite a good show of both tops and bottoms. They were inter-cultivated during early December, but labor available would not permit of thinning and weeding properly. As they were well developed by the end of December (lamb weaning time), the lambs were taken from their mothers, and grazed on them. The lambs made good use of them, developing themselves well. Field No. 9F was given a heavier seeding than the other two fields, and produced quite the best growth. Only the tops of these turnips were fed, the bottoms being reserved for next winter feed; they carried the equivalent of three sheep per acre per year. Fields Nos. 6A and 4b were fed right out, and produced a much poorer grazing record, averaging only 1.75 sheep per acre per year. In Field No. 6A was included a plot of swedes. These made a little less growth than the turnips, but the sheep relished them more than the latter.

*Kale* was sown in Field No. 20A during October on well-prepared soil, and a good germination was secured. As the bulk of the feeding

of this will be secured during 1922, the grazing returns will appear in that year's report.

*Cow Peas.*—In the five-course rotation under test, Field No. 20c was due to be sown to field peas this year. However, the field was too wet to be properly prepared and sown in reasonable time, hence the summer legume cow pea was given a trial. The soil was well ploughed early in the winter, and worked to a good tilth as soon as the soil began to warm in the spring, and drilled early in October with 20lbs. seed per acre in rows 3ft. apart. The black variety, "Whip-poor-will," germinated very well, and the plants showed their ability to withstand dry conditions, and although they made slow growth, they lived throughout the whole summer, and many plants produced quite a lot of well-filled pods, but the crop generally gave only light grazing.

*Ensilage Crops.*—Fields Nos. 3A, 3B, and 11 were sown with a mixture of wheat (60lbs. Queen Fan) and oats (40lbs. Algerian) per acre on autumn-prepared land. Fields Nos. 3A and 3B had carried green forage crops during 1920, and No. 11 had been under natural pasture; 100lbs. super per acre was applied with the seed. Portions of Fields 3A and 3B produced very rank growth, but on the whole a very good sample of green stuff for silage-making was produced. A small odd corner of green feed in Field 16A, growing rye, oats, and barley (mixed), was also put into the silo. The average return of, approximately, 5½ tons per acre secured from cereal silage must be regarded as very fair, considering that our soils are not overcharged with humus. The following table shows the individual returns of ensilage secured from the various fields, together with the return of sunflower silage from Field No. 17:—

*Ensilage Yields, Kybybolite, 1921.*

Field.	Area. Acres.	Variety of Crop.	Total Yield.			Yield per Acre.		
			T.	C.	L.	T.	C.	L.
No. 11 . . .	2.33	Wheat and oats	15	14	56	6	14	110
No. 3A . . .	2.86	Wheat and oats	16	9	56	5	15	23
No. 3B . . .	6.20	Wheat and oats	33	5	0	5	7	28
No. 16A . . .	1.56	Rye, barley, and oats	5	12	0	3	11	89
	12.95	Total cereal silage	71	1	0	5	9	82
No. 17 . . .	6.06	Sunflowers	14	7	70	2	7	52
	19.01	Grand total silage	85	8	70	4	9	99

The following table shows the ensilage returns for the two seasons since the silo has been in use:—

*Ensilage Returns, Kybybolite, 1921-1922.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.			Yield per Acre.		
	In.	In.		T.	C.	L.	T.	C.	L.
1920 . . . .	20.87	19.20	25.27	44	10	84	1	15	24
1921 . . . .	22.49	18.53	19.01	85	8	70	4	9	99
Means . .	21.68	18.86	—	—			3	2	61



*Hay Crops.*—Haygrowing is important on a livestock farm such as this, and our requirements are increasing with the number of large stock, and this year we found it necessary to cut and stack close upon 200 tons of cereal hay. Three types were grown, namely, wheat and oats separately and mixed together.

*Mixed Hay.*—Field No. 15 carried a rather poor, patchy barley crop during 1920, and as quite a fair area had been practically bare through the summer, it was thought safe to crop the field again. It was broken during April, and drilled with a mixture of 60lbs. Queen Fan wheat and 40lbs. Algerian oats with 1cwt. super per acre at the end of that month. As it ploughed up roughly, it was necessary to break it down with the roller before seeding. The crop grew well, and never looked back until the October weather. It ripened off rather too quickly, and it was found necessary to leave half of the field for grain, to avoid having a lot of over-ripe hay on hand. Four pounds of King Island melilotus per acre was broadcasted over portion of this field, and made quite a good growth amongst the cereals, improved the quality of the hay, and should improve the field for pasture during 1922. Portions of Fields Nos. 11 and 18 were also sown with the above cereal mixture. No. 18 was not ploughed and sown until late in May, but the seed germinated and started well. The field being a wet one and containing a poorer class of soil than No. 15, the resulting crop can be looked upon as satisfactory. The plot of vetches and oats (mixed) in Field No. 9E in six-course rotation has been included with the mixed hay, and the following table shows the yields for mixed hays for the season :—

*Mixed Hay Yields, Kybybolite, 1921.*

Crop.	Field Grown.	Area. Acres.	Yield per Acre.		
			T.	C.	L.
Wheat and oats . . . . .	No. 15	29.66	82	18	70
Wheat and oats . . . . .	No. 11	3.16	5	6	56
Vetches and oats . . . . .	No. 9E	1.94	3	4	70
Wheat and oats . . . . .	No. 18	32.43	34	15	42
Rye and oats . . . . .	No. 16A	1.27	1	2	98
Total mixed . . . . .		68.46	127	8	0
			1	17	25

*Oaten Hay.*—Rotation plot Field No. 6B was sown exclusively for hay with 60lbs. Algerian oats per acre. It was sown early on well-prepared dry land that should have carried a turnip crop the previous season, but the germination of this crop failing, the soil had remained bare through the summer. However, the oats did not get away at all quickly, and Cape dandelion helped considerably to lower the yield. Field No. 3 was grazed as green forage during 1920. We were unable to break it up until comparatively late in the season, and it was sown during the early part of June intentionally for a grain crop. However, the caterpillars started attacking seriously, and 14 acres of

Algerian oats were cut for hay, and produced quite a nice quality hay, not very tall, but well headed. The following table gives details of oaten hay yields:—

*Oaten Hay Yields, Kybybolite, 1921.*

Crop.	Field Grown.	Area. Acres.	Total Yield.			Yield per Acre.		
			T.	C.	L.	T.	C.	L.
Algerian . . . . .	No. 3	14.13	20	2	98	1	8	57
Algerian . . . . .	No. 6B	9.57	10	13	28	1	2	32
Total oaten . . . . .		23.70	30	16	14	1	6	0

*Wheaten Hay.*—The only field sown for wheaten hay was No. 16B under test of ground rock phosphates. On account of soil hardness we were unable to plough it until late in May; 80lbs. White Tuscan wheat was sown per acre on May 31st, but germination was poor, and the crop made very little headway all the season. Fields Nos. 4c and 6F were sown in rotations, with 60lbs. White Tuscan wheat per acre for grain crops, towards the end of May. These germinated well, and produced a nice growth, but unfortunately red rust appeared rather thickly in them, and hence the bulk of them was cut for hay. The following table shows the yields of wheaten hay for the season:—

*Wheaten Hay Yields, Kybybolite, 1921.*

Crop.	Field Grown.	Area. Acres.	Total Yield.			Yield per Acre.		
			T.	C.	L.	T.	C.	L.
White Tuscan . . . . .	No. 6F	9.94	19	9	14	1	19	17
White Tuscan . . . . .	No. 4c	2.99	5	1	14	1	13	92
White Tuscan (exp.) . . . .	No. 16B	10.00	8	3	56	0	16	39
Mixed headlands . . . . .	No. 13	3.48	1	2	28	0	6	44
Total wheaten . . . . .		26.41	33	16	0	1	5	67

The next two tables set out the total hay cut and the yield per acre in the one case, and in the other the averages secured for the different types for the period 1918-1921:—

*Hay Yields, Kybybolite, 1921.*

Kind.	Area. Acres.	Total Yield.			Yield per Acre.		
		T.	C.	L.	T.	C.	L.
Wheat and oats . . . . .	68.46	127	8	0	1	17	25
Oaten . . . . .	23.70	30	16	14	1	6	0
Wheaten . . . . .	26.41	33	16	0	1	5	67
Farm average . . . . .	118.57	192	0	14	1	12	43



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"VICTORIA SEED WAREHOUSE,"

**64, ELIZABETH ST., MELBOURNE.**

*Cereal Hay Crops, Kybybolite, 1918-1921.*

	Yield per Acre.											
	Oaten.			Mixed Wheat and Oats.			Wheaten.			Farm Average.		
	T.	C.	L.	T.	C.	L.	T.	C.	L.	T.	C.	L.
1918 . . . . .	1	4	97	0	16	106	1	5	30	1	2	58
1919 . . . . .	1	11	26	1	14	52	1	1	89	1	8	45
1920 . . . . .	0	17	92	0	17	4*	0	12	70	0	17	4
1921 . . . . .	1	6	0	1	17	25	1	5	67	1	12	43
Means . . .	1	4	110	1	6	47	1	1	36	1	5	9

\* As no mixture of hay was grown during 1920, the average hay yield for the season has been allowed for that year.

The following table shows the returns of hay for the farm since 1910, and the average yield for this season of 32cwts. per acre cannot but be regarded as satisfactory, especially as that average extends over 118 acres, consisting of some of the poorer land as well as some of our better soil:—

*Hay Returns, Kybybolite, 1910-1921.*

Year.	Total Rainfall.	“ Useful ” Rainfall.	Area. Acres.	Total Yield. Tons cwts. lbs.			Yield. per Acre. Tons cwts. lbs.		
	Tons.	Lbs.							
1910 . . . . .	28.35	21.08	106.13	88	19	28	0	16	85
1911 . . . . .	22.23	14.72	94.04	136	6	110	1	9	28
1912 . . . . .	20.83	18.23	26.29	67	7	70	2	10	76
1913 . . . . .	18.44	13.93	108.55	166	11	0	1	10	77
1914 . . . . .	11.94	8.43	109.00	90	1	0	0	16	59
1915 . . . . .	23.30	21.18	108.66	111	14	50	1	0	65
1916 . . . . .	23.53	20.19	77.35	135	1	0	1	14	102
1917 . . . . .	26.69	21.90	96.77	49	9	0	0	10	25
1918 . . . . .	18.32	16.44	152.85	172	1	50	1	2	58
1919 . . . . .	15.60	11.43	148.81	211	7	14	1	8	45
1920 . . . . .	20.87	19.20	66.05	56	5	28	0	17	4
1921 . . . . .	22.49	18.53	118.57	192	0	14	1	12	43
Means . . .	21.05	17.11	—	—	—	—	1	5	93

*Oat Crops.*—Oat grain is largely needed for concentrate feed for both cattle and horses, hence a fair area was sown to this crop, mostly early and in comparatively dry soil. Some very heavy yields were promising until the advent of caterpillars, which damaged to some extent practically all oat crops, and in two cases absolutely stripped the fields of oat heads.

Field No. 20p in the five-course rotation should have carried a kale crop for the previous two years, but this crop was a failure, and as the soil was in a workable condition the field was skim-ploughed during

March, and sown dry with 60lbs. Algerian oats and 1ewt. super per acre. The oats made a thick, strong growth, and promised a fine yield of grain, but during November the caterpillars got busy, and wrought so much damage in this field that none of the crop was worth harvesting.

Field No. 4A.—The turnip crop in this field in 1920 was a failure, and the soil was in good bare fallow condition during the summer, and was sown dry at end of March with 60lbs. Calcutta oats and 1ewt. super per acre. This crop made a particularly quick and good growth, and advantage was taken to use a portion of it for winter green feed for the milking herd. Approximately, 18 tons of green feed were cut from  $2\frac{1}{2}$  acres of the plot. The balance promised well for grain, but caterpillars robbed nearly the whole of it.

Field No. 9A.—Turnips also failed in this field during 1920. It was cultivated on March 29th, and drilled on April 1st with 60lbs. Algerian oats and 1ewt. super per acre. This crop was only partially attacked by caterpillars.

Field No. 18.—About 18 acres of the eastern end of this field, one of the poorer of the farm, were ploughed and cultivated as bare fallow during the spring of 1920. This was cultivated on May 4th and 5th, and immediately sown with 60lbs. Calcutta oats and 1ewt. super per acre. This crop started well, but never thrived through the wet months, and failed to recover in the spring. The caterpillars spoiled the grain yield considerably.

Field No. 2.—This field carried an ensilage crop in 1920. It was not ploughed until late—June 9th to 11th—and immediately sown with 60lbs. Algerian oats and 1ewt. super per acre. The crop germinated well, but then looked rather poor and sickly until the spring, when it recovered somewhat, and eventually produced a fair average yield of nice plump grain.

Field No. 3.—This field was ploughed during the first week of June, and cultivated again before drilling. On June 13th and 14th we sowed small plots of our latest selections of local oats, together with six new varieties received from Roseworthy College. Good healthy growth was maintained throughout the season, and the returns received from some of the new varieties are very satisfactory. However, in fairness to our old established varieties, it is necessary to note the plots of local oats were situated nearer to the field boundary, and suffered more from the attack by caterpillars. Future trials with these new oats will be watched with interest.

Field No. 19.—A small plot of Algerian oats was also sown in this field to fill a corner late in the season.

The following is a list of the varieties grown in various fields and their yields:—

*Oat Variety Yields, Kybybolite, 1921.*

Variety.	Field Grown.	Area. Acres.	Total Yield.		Yield per Acre.	
			B.	L.	B.	L.
Kherson . . . . .	No. 3	0.65	29	17	45	11
Smyrna . . . . .	No. 3	0.65	28	20	43	34
Ruakura . . . . .	No. 3	0.65	25	12	38	37
Kelsall's . . . . .	No. 3	0.65	23	19	36	5
Stark's . . . . .	No. 3	0.65	17	27	27	8
Algerian . . . . .	No. 2	17.07	432	30	25	14
Early Burt . . . . .	No. 3	0.39	9	24	24	25
Sunrise . . . . .	No. 3	0.26	6	5	23	22
Calcutta . . . . .	No. 3	0.23	4	34	21	3
Clydesdale . . . . .	No. 3	0.25	5	0	20	0
Algerian Tartars . .	No. 3	0.24	3	16	14	7
Goldfinder . . . . .	No. 3	0.26	2	8	8	18
Algerian . . . . .	No. 9A	1.94	12	28	6	22
Algerian . . . . .	No. 3	0.25	1	19	5	36
Algerian . . . . .	No. 19	5.08	21	30	4	11
Calcutta . . . . .	No. 18	18.32	76	31	4	8
Calcutta . . . . .	No. 4A	5.28	7	39	1	20
Farm average . .		52.82	708	39	13	17

Although four of our usual varieties were not grown during 1920, the following table will serve to show the behavior of the six chief varieties since 1917:—

*Yields of Oat Varieties, Kybybolite, 1917-1921.*

	1917.		1918.		1919.		1920.		1921.		Means, 1917-21.	
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
Calcutta . . . . .	12	15	16	36	17	23	32	37	3	30	16	26
Algerian . . . . .	4	6	15	2	26	8	14	7	19	10	15	31
Clydesdale . . . . .	5	23	18	23	7	39	—	—	20	0	13	1
Sunrise . . . . .	1	31	3	30	21	1	—	—	23	22	12	21
Goldfinder . . . . .	2	35	11	38	21	2	—	—	8	18	11	3
Algerian Tartar . .	2	20	9	5	12	3	—	—	14	7	9	19
Farm average . .	7	19	15	1	22	22	16	36	13	17	15	3
	In.		In.		In.		In.		In.		In.	
Total rainfall . .	26.69		18.32		15.60		20.87		22.49		20.79	
“Useful” rainfall	21.90		16.44		11.43		19.20		18.53		17.32	

The average yield for the season of 13½bush. cannot but be looked upon as unfortunate, as the actual growth of oats generally was much above the average.

The following list shows detailed returns of oats since 1910:—

*Oat Returns, Kybybolite, 1910-1921.*

Year.	Total Rainfall.	“Useful” Rainfall.	Area. Acres.	Total Yield.		Yield per Acre.	
	In.	In.		Bush.	lbs.	Bush.	lbs.
1910 .. .. .	28.35	21.08	77.00	1,001	0	13	0
1911 .. .. .	22.23	14.72	60.91	828	13	13	24
1912 .. .. .	20.83	18.23	103.00	3,450	36	33	20
1913 .. .. .	18.44	13.93	94.55	1,460	10	15	18
1914 .. .. .	11.94	8.43	6.00	61	3	10	7
1915 .. .. .	23.30	21.18	79.74	1,251	25	15	28
1916 .. .. .	23.53	20.19	61.94	1,388	39	22	17
1917 .. .. .	26.69	21.90	20.66	154	13	7	19
1918 .. .. .	18.32	16.44	36.93	554	25	15	1
1919 .. .. .	15.60	11.43	50.77	1,144	34	22	22
1920 .. .. .	20.87	19.20	36.29	613	1	16	36
1921 .. .. .	22.49	18.53	52.82	708	39	13	17
Means . . . . .	21.05	17.11	—	—	—	16	24

*Barley Crops.*—Two fields, Nos. 6D and 19, were sown to barley, and as conditions were favorable the seed was sown early in July, and a really good germination resulted. However, the excessive wet August and heavy falls in early September gave them a heavy setback, from which they did not properly recover. Also No. 6D was attacked by cockatoos immediately after germination, and these greatly thinned the stand of crop. Only one variety (Shorthed) was grown, and the yield was slightly better in Field No. 19 than the other. Altogether 339bush. 27lbs. barley were secured from 54.56 acres, averaging the poor return of 6bush. 11lbs. per acre. The following table gives the barley returns received since 1910:—

*Barley Returns, Kybybolite, 1910-1921.*

Year.	Total Rainfall.	“Useful” Rainfall.	Area. Acres.	Total Yield.		Yield per Acre.	
	In.	In.		Bush.	lbs.	Bush.	lbs.
1910 .. .. .	28.35	21.08	45.39	299	29	6	30
1911 .. .. .	22.23	14.72	58.76	552	16	9	20
1912 .. .. .	20.83	18.23	50.00	1,500	0	30	0
1913 .. .. .	18.44	13.93	35.00	527	0	15	3
1914 .. .. .	11.94	8.43	3.02	37	48	12	29
1915 .. .. .	23.30	21.18	50.28	789	39	15	35
1916 .. .. .	23.53	20.19	43.24	273	37	6	17
1917 .. .. .	26.69	21.90	66.31	304	41	4	30
1918 .. .. .	18.32	16.44	35.08	266	48	7	31
1919 .. .. .	15.60	11.43	39.71	650	1	16	19
1920 .. .. .	20.87	19.20	55.77	474	7	8	25
1921 .. .. .	22.49	18.53	54.56	339	22	6	11
Means . . . . .	21.05	17.11	—	—	—	11	29

*Rye Crop.*—Field No. 16 was broken up about the middle of June, and sown to rye. This germinated well and made good growth, producing quite a nice lot of good length thatching straw. The grain is utilised to mix with other cereals for producing winter green feed for stock grazing. From the 10.44 acres, 80bush. 4lbs. grain were secured,

*i.e.*, an average of 7bush. 37lbs. per acre, which the following table shows is a little better than the average secured since 1914:—

*Rye Returns, Kybybolite, 1914-1921.*

Year.	Total Rainfall.	“Useful” Rainfall.	Area. Acres.	Yield	
	In.	In.		Total Yield. Bush. lbs.	per Acre. Bush. lbs.
1914 . . . . .	11.94	8.43	6.00	90 16	15 3
1915 . . . . .	23.20	21.18	7.27	57 44	7 48
1916 . . . . .	23.53	20.19	8.20	35 3	4 14
1917 . . . . .	26.69	21.90	—	Failure	
1918 . . . . .	18.32	16.44	4.62	52 0	11 15
1919 . . . . .	15.60	11.43	7.23	37 7	5 8
1920 . . . . .	20.87	19.20	14.71	47 48	3 14
1921 . . . . .	22.49	18.53	10.44	80 4	7 37
Means . . . . .	20.33	17.16	—	—	6 45

*Wheat Crops.*—A larger area than usual was harvested for wheat grain, because on account of the large bulk of straw growth less area was needed to produce hay requirements.

Field 6F carried a pea crop during 1920, was ploughed during March, and was rolled down, cultivated, and drilled with White Tuscan wheat on May 27th at the rate of 60lbs. seed and 1ewt. super per acre. This made quite a nice crop, and returned the best average yield on the farm for the season.

Field 20B.—This field was too wet to sow to peas during 1920, and was therefore treated as bare fallow. It was lightly skimmed during February, and cultivated and sown from May 7th to May 10th with 60lbs. Queen Fan wheat and 1ewt. super per acre. This field is worked in 17ft. 6in. ridges. The crop made really good healthy growth, but unfortunately did not fill its ears with grain, a fact most probably attributable to the abnormal weather conditions of the middle of October.

Field 4c carried wheat in the Norfolk rotation series this season, and, like the two previous mentioned, is sown on pea stubble. The field was ploughed and sown after the weather broke at the latter end of May; 60lbs. White Tuscan seed was sown with 1ewt. super per acre.

Field 9b carried wheat in a six-course rotation, but in this case the grain crop follows two years' grazing of rye grass and clover. The plot was ploughed early in March, and dressed with 1 ton lime per acre, was cultivated and rolled to good tilth on May 16th, and drilled with 60lbs. Federation wheat and 1ewt. super per acre.

Field No. 14 was used as a grazing field during 1920, was ploughed during February and early March, cultivated, rolled, and drilled from May 9th to 24th. Varieties that were thought suitable to the district were sown in small area plots, and one wheat new to the district (Leak's Rustproof) showed out to advantage. All the varieties secured a good start. A later growth of weeds affected them somewhat, but the unfortunate weather at grain setting time greatly reduced all yields.



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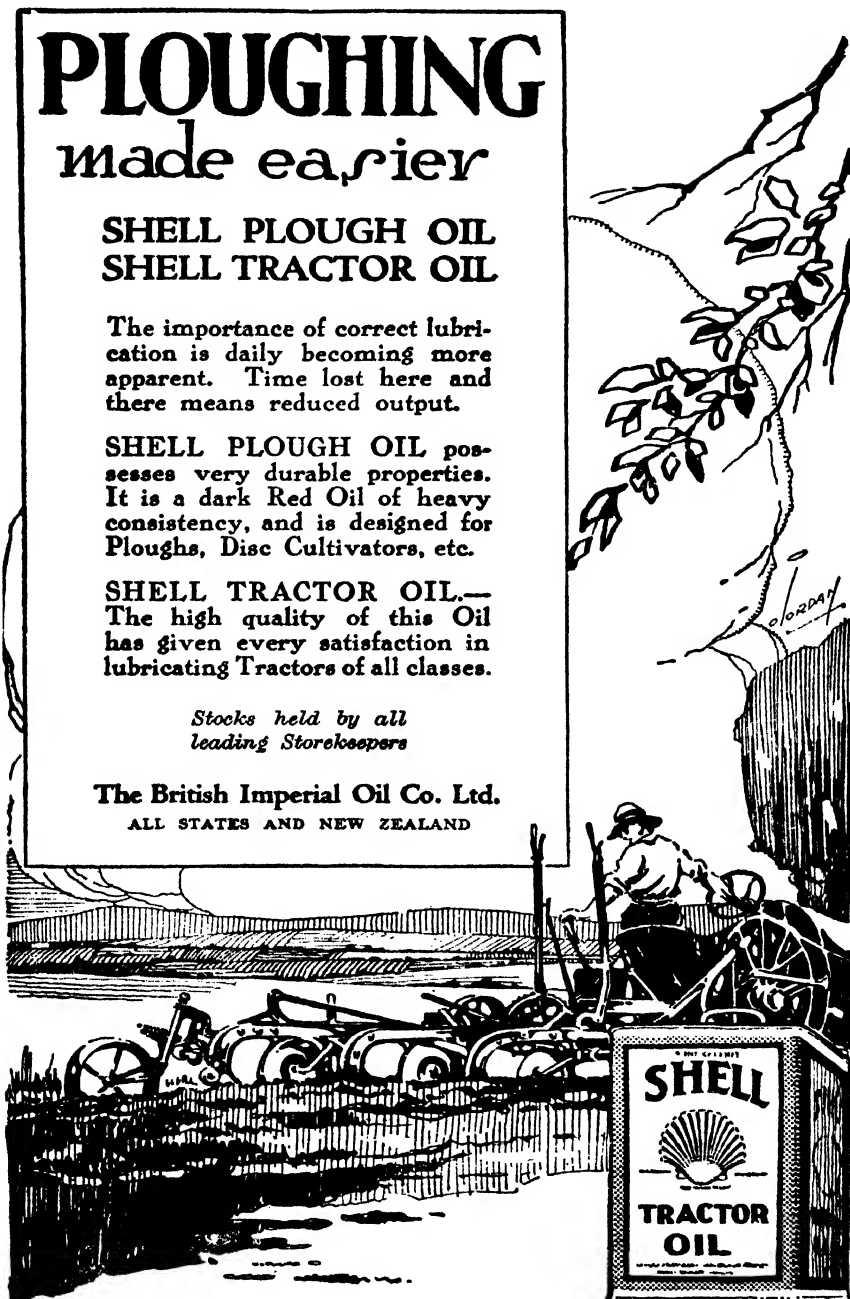
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Field No. 13 was also grazed during 1920, and we were only able to give it very poor soil preparation and seeding conditions, excessive wetness made it impossible to obtain a good tilth all over the field. The land was ploughed in 35ft. ridges early in June, and immediately sown with Federation and Queen Fan wheats.

The general yields of wheat received from the various fields are shown in the following table:—

*Wheat Field Yields, Kybybolite, 1921.*

Variety.	Field Grown.	Area. Acres.	Crop in Field, 1920.	Total Yield.		Yield per Acre.	
				B.	L.	B.	L.
White Tuscan . . . .	No. 6F	0.87	Peas (grain)	16	18	18	44
Queen Fan . . . . .	No. 20B	27.37	Bare fallow	484	21	17	42
Queen Fan . . . . .	No. 15	34.62	Barley (grain)	452	57	13	5
Federation . . . . .	No. 9D	1.94	Rye grass grazing	23	28	12	6
Varieties (various). Federation and	No. 14	37.30	Natural grazing	359	58	9	39
Queen Fan . . . . .	No. 13	22.08	Natural grazing	202	41	9	11
White Tuscan . . . .	No. 4C	1.06	Peas (grain)	9	11	8	40
Farm average . . . .		125.24		1,548	54	12	22

The variety yields follow in their order of productivity, and it is pleasing to note such a useful all-round wheat as White Tuscan heading the list, closely followed by another favorite, Queen Fan. The future doings of Leak's Rustproof and White Essex will also be worth watching, as both these yielded above the average in their respective fields.

*Wheat Variety Yields, Kybybolite, 1921.*

Variety.	Field Grown.	Area. Acres.	Total Yield.		Yield per Acre.	
			B.	L.	B.	L.
White Tuscan . . . .	No. 6F	0.87	16	18	18	44
Queen Fan . . . . .	No. 20B	27.37	484	21	17	42
Queen Fan . . . . .	No. 15	34.62	452	57	13	5
Federation . . . . .	No. 9D	1.94	23	28	12	6
Yandilla King (local seed) . . . . .	No. 14	11.69	131	25	11	15
Leak's Rustproof . .	No. 14	2.90	32	8	11	5
White Essex . . . . .	No. 14	2.79	30	2	10	46
Federation . . . . .	No. 13	11.48	122	15	10	39
Federation . . . . .	No. 14	3.04	30	36	10	4
White Tuscan . . . .	No. 14	0.27	2	33	9	27
Caliph . . . . .	No. 14	2.67	25	13	9	27
Yandilla King (Turfield seed) . .	No. 14	3.05	27	38	9	4
White Tuscan . . . .	No. 4C	1.06	9	11	8	40
Mixed grain (headlands) . . . . .	No. 14	3.69	29	21	7	57
Queen Fan . . . . .	No. 14	3.04	23	24	7	42
Queen Fan . . . . .	No. 13	10.60	80	26	7	35
Crossbred 53 (early)	No. 14	2.91	20	40	7	6
Huron . . . . .	No. 14	0.83	5	17	6	22
Prelude . . . . .	No. 14	0.42	1	41	4	0
Farm average . . . .		125.24	1,548	54	12	22

The following table gives the yields of the four main varieties grown consistently at the farm since 1912:—

*Yields of Wheat Varieties, Kybybolite, 1912-1921.*

	Means,																Means,	
	1912-																1912-	
	1914.		1915.		1916.		1917.		1918.		1919.		1920.		1921.		1921.	
Variety.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
White Tuscan ..	24	57	11	16	24	5	4	20	19	21	15	2	22	55	12	45	18	27
Queen Fan .. ..	18	43	17	43	21	10	3	17	20	41	27	15	10	25	13	46	16	37
Federation .. ..	23	5	12	13	20	25	3	45	20	5	8	47	8	2	10	43	15	19
Yandilla King ..	19	41	6	13	27	2	2	46	22	34	7	51	8	14	10	47	14	27
	<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>	
Farm average .	20	8	11	5	18	59	3	26	17	34	15	13	11	13	12	22	15	2

The general average yield of wheat of 12bush. 22lbs. is disappointing, and is accounted for by the excessive wet at the end of winter and the extremely hot conditions that prevailed just as the grains were setting in the ears.

The following table shows the wheat returns since 1910:—

*Wheat Returns, Kybybolite, 1910-1921.*

Year.	Total Rainfall. In.	"Useful" Rainfall. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield Per Acre. Bush. lbs.
	In.	In.	Acres.	Bush. lbs.	Bush. lbs.
1910 .. . . .	28.35	21.08	15.00	79 43	5 19
1911 .. . . .	22.23	14.72	17.15	232 45	13 34
1912 .. . . .	20.83	18.23	81.91	1,876 35	22 54
1913 .. . . .	18.44	13.93	48.20	1,288 56	26 44
1914 .. . . .	11.94	8.43	22.17	238 32	10 46
1915 .. . . .	23.30	21.18	79.64	882 31	11 5
1916 .. . . .	23.53	20.19	98.75	1,875 19	18 59
1917 .. . . .	26.69	21.90	70.46	221 29	3 26
1918 .. . . .	18.32	16.44	58.52	1,027 40	17 34
1919 .. . . .	15.60	11.43	78.26	1,190 50	15 13
1920 .. . . .	20.87	19.20	73.37	812 8	11 13
1921 .. . . .	22.49	18.53	125.24	1,548 54	12 22
Means .. . . .	21.05	17.11	—	—	14 5

*Pea Crops.*—Pea crops were sown in three fields in various rotations.

Field No. 6E carried a barley crop during 1920. It was ploughed early in March and limed with 30cwt. per acre. From May 20th to 27th the field was worked down and sown with Early Dun peas at the rate of 100lbs. per acre, with 1cwt. super. Germination was good, and together with self-sown barley the peas made really nice growth, and were only lightly affected by caterpillars.

Field No. 4B produced a good oat crop during 1920. It was ploughed and limed during April with 1 ton slaked lime per acre, worked down at end of June, and sown with seed and manure similar to the previous field. Good growth was made, but peas did not pod as well as in Field 6E, and then the caterpillars wrought much damage before harvest.

Field No. 16c consists of somewhat poorer soil, which is also not well drained. The field was under wheaten hay plots during 1920, and this year the plots carried the peas under similar manure plots of various phosphates. Particulars of manuring are given later under "Experiments with Raw Rock Phosphates." This field was not ploughed until near the end of June, and almost immediately worked down and sown with 100lbs. Early Dun peas per acre. Very fair growth was made, but caterpillars helped materially to lower the yields.

The following table gives the yields received from each field:—

*Pea Yields, Kybybolite, 1921.*

Variety.	Field Grown.	Area. Acres.	Total Yield.		Yield per Acre.
			B.	L.	
Early Dun .. .. .	No. 6E	8.87	116	1	13 5
Early Dun .. .. .	No. 16c	10.00	56	38	5 40
Early Dun .. .. .	No. 4B	5.35	17	16	3 14
Farm average .		24.22	189	55	7 50

The ensuing table shows the returns of field peas secured on the farm since 1916. Such results are disappointing and unfortunate. However, because the pea is a valuable feed for stock and it is also a good soil enricher, we will persevere with the cultivation of this crop:—

*Field Pea Returns, Kybybolite, 1916-1921.*

Year.	Total Rainfall.	"Useful" Rainfall.	Area. Acres.	Total Yield.		Yield per Acre.
	In.	In.		B.	L.	
1916 .. .. .	23.53	20.19	33.64	498	34	14 49
1917 .. .. .	26.69	21.90		Failure.		
1918 .. .. .	18.32	16.44	27.54	21	20	0 46
1919 .. .. .	15.60	11.43	42.68	80	41	1 53
1920 .. .. .	20.87	19.20	4.05	6	11	1 32
1921 .. .. .	22.49	18.53	24.22	189	55	7 50
Means . . .	21.25	17.95	—	—	—	4 28

*Black Vetches.*—One acre of these was tried in Field No. 16A. The land was well prepared and the vetches sown on June 4th at the rate of 40lbs. seed per acre, with 1cwt. super. The plot made quite a thick, strong growth, and podded well, but here again caterpillars made great ravage, and only 1bush, 15lbs. of grain was secured at harvest.

*Linseed.*—This crop was again tried this year in part of Field No. 16A. Two acres were well prepared early, and sown on June 4th, 40lbs. seed being broadcasted after the plot had been given a dressing of 1cwt. super. The higher portion of the plot made very good growth, and the whole plot headed well, but, like the vetches, was badly

attacked by caterpillars during the spring, and hence only the later flowered plants produced seed at harvest time, when 64lbs. linseed were secured from the 2 acres.

The following table summarises generally the returns of chief crops harvested for 1921, showing the average yield per acre, with their values, at current rates, and also as stock food compared with hay at £3 per ton, based on tables prepared by the Director of Agriculture (Professor Arthur J. Perkins):—

*Value of Crops Harvested, Kybybolite, 1921.*

Type of Crop.	Yield per Acre.			Value per Acre at Current Rates.			Value per Acre as Stock Food.		
	T.	C.	L.	s.	d.	£ s. d.	s.	d.	£ s. d.
Ensilage . . . . .	4	9	99	at 15	0	ton = 3 7 5; at 19	5	ton = 4 7 3	
Hay . . . . .	1	12	43	at 60	0	ton = 4 17 2; at 60	0	ton = 4 17 2	
	B. L.								
Wheat (grain) . . . . .	12	22	at 5	0	bush. = 3 1 10; at 3	10	bush. = 2 7 5		
Peas (grain) . . . . .	7	50	at 7	6	bush. = 2 14 10; at 3	7	bush. = 1 8 1		
Oats (grain) . . . . .	13	17	at 2	6	bush. = 1 13 7; at 2	1	bush. = 1 8 0		
Rye (grain) . . . . .	7	37	at 3	0	bush. = 1 3 0; at 3	9	bush. = 1 8 9		
Barley (grain) . . . . .	6	11	at 3	0	bush. = 0 18 8; at 2	7	bush. = 0 16 1		

EXPERIMENTS WITH RAW ROCK PHOSPHATE.

Experiments to test the agricultural value of raw rock phosphates were commenced at Kybybolite in 1919, the rocks being tried containing (a) Calcium phosphate and (b) aluminium phosphate, equivalent to about 18 per cent. of phosphoric acid, so being low-grade phosphates.

*Raw Rock Phosphates on Crops to be Harvested.*—For the testing of the rock phosphates on crops to be harvested, a rotation consisting of wheat (for hay)—peas was laid down, in which both the wheat and pea crops are dressed with the same fertilisers, as is shown below:—

*Wheat—Peas Rotation.*

Plot.	1919.	1920.	1921.
1	Wheat—No manure	Peas—No manure	Wheat—No manure
1A	Peas—No manure	Wheat—No manure	Peas—No manure
2	Wheat—5cwt. lime	Peas—5cwt. lime	Wheat—5cwt. lime
	1cwt. super	1cwt. super	1cwt. super
2A	Peas—5cwt. lime	Wheat—5cwt. lime	Peas—5cwt. lime
	1cwt. super	1cwt. super	1cwt. super
3	Wheat—1cwt. super	Peas—1cwt. super	Wheat—1cwt. super
3A	Peas—1cwt. super	Wheat—1cwt. super	Peas—1cwt. super
4	Wheat—11cwt. aluminium phosphate	Peas—1cwt. aluminium phosphate	Wheat—1cwt. aluminium phosphate
4A	Peas—11cwt. aluminium phosphate	Wheat—1cwt. aluminium phosphate	Peas—1cwt. aluminium phosphate
5	Wheat—11cwt. calcium phosphate	Peas—1cwt. calcium phosphate	Wheat—1cwt. calcium phosphate
5A	Peas—11cwt. calcium phosphate	Wheat—1cwt. calcium phosphate	Peas—1cwt. calcium phosphate

The results secured from these plots during the past three seasons are shown in the following tables. It is noticeable that Plot 2, which receives the lime and superphosphate as manure, holds a slight advantage over the others in producing wheaten hay, but the returns from peas show a different variation in the mean yields. It is worthy of note that during the 1921 season Plot 2A grew by far the greater bulk amongst the pea plots, and it was somewhat surprising that the yield of grain was not so high as from some of the other plots that carried less growth of leaves and stems.

It is reasonable to expect that the development of bacteria on the pea roots is in proportion to the top growth of plants, hence we can doubtless expect to find a gradual increasing advantage in fertility in Plots 2 and 2A, which should show in subsequent yields received from these plots.

*Raw Rock Phosphate Tests on Wheaten Hay, Kybybolite, 1919-1921.*

Plot.	Manuring per Acre.	1919.			1920.			1921.			Means, 1919-1921.		
		T.	C.	L.	T.	C.	L.	T.	C.	L.	T.	C.	L.
1. No manure . . . . .		0	10	84	0	9	0	0	18	84	0	12	93
2. 5cwts. lime, 1ewt. superphosphate . . . . .		1	6	105	0	17	35	0	18	28	1	0	93
3. 1ewt. superphosphate . . . . .		1	7	28	0	13	0	0	17	84	0	19	37
4. 1ewt. aluminium phosphate rock . . . . .		1	6	91	0	12	91	0	14	91	0	18	16
5. 1ewt. calcium phosphate rock . . . . .		1	3	7	0	11	0	0	12	21	0	15	47

*Raw Rock Phosphate Tests on Peas, Kybybolite, 1919-1921.*

Plot.	Manuring per Acre.	1919.		1920.	1921.		Means, 1919-21.	
		B.	L.		B.	L.	B.	L.
1. No manure . . . . .		0	30	Total Failure	2	54	1	8
2. 5cwts. lime, 1ewt. superphosphate . . . . .		1	17		5	26	2	14
3. 1ewt. superphosphate . . . . .		1	4		7	4	2	43
4. 1ewt. aluminium phosphate rock . . . . .		1	30		7	10	2	53
5. 1ewt. calcium phosphate rock . . . . .		0	39		5	45	2	8

In the above plots, White Tuscan wheat at the rate of 80lbs. per acre was sown on May 31st, and Early Dun field peas at the rate of 100lbs. per acre on July 4th.

**RAW ROCK PHOSPHATE ON NATURAL PASTURE.**

The same two rock phosphates are being tested on natural pasture on plots of  $3\frac{1}{2}$  acres in area, and the following table shows the variety

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of manure applied and year of top-dressing, together with the feeding secured in sheep per acre per annum for the year 1921:—

*Returns of Natural Grazing Test, Kybybolite, 1921.*

Plot.	1919.	Manure applied per Acre.		1921.	Grazing, 1921. Sheep per Acre.
		1920.			
1.	1 ton aluminium phosphate	Nil.		Nil	1.52
2.	11ewts. aluminium phosphate	1ewt. aluminium phosphate		1ewt. aluminium phosphate	1.64
3.	1 ton lime and 1ewt. superphosphate	1ewt. super		1ewt. super	1.84
4.	11ewts. calcium phosphate	1ewt. calcium phosphate		1ewt. calcium phosphate	1.48
5.	1 ton calcium phosphate	Nil		Nil	1.33
6.	No manure	Nil		Nil	1.11

Through not having water laid to each plot, the plots could not be grazed very continuously, and were fed in short periods with comparatively large flocks of sheep. Plot 3 produced the best quality, as well as the best quantity, of feed.

ROTATION OF CROPS EXPERIMENTS.

*Rotation A.*—Five-course, with 30-acre fields of crops in the following routine:—Kale, kale, oats, peas or legume, wheat. The appending table gives the results available for this rotation since its commencement in 1918:—

*Five-course Rotation of Crops, Kybybolite, 1918-1921.*

Year.		Oats.				Peas.		Wheat.			
		Hay.		Grain.		Grain.		Hay.		Grain.	
		T.	C.	L.	B.	B.	L.	T.	C.	L.	B.
1918	.. .. (20A)	0	14	82	15	25	(20K)	0	46	(20D)	1
1919	.. .. (20B)	1	18	22	36	32	(20A)	2	7	(20E)	2
1920	.. .. (20C)	—		14	14		(20B)	Not sown	(20A)	—	11
1921	.. .. (20D)	Caterpillars destroyed				(20C)	Cow peas not harvested	(20B)	—		17
Means	..	1	6	52	22	10	1	26	1	18	79

*Rotation B.*—Six-course, with 2 acre plots in the following routine of crops:—Wheat, oats and vetches (hay), turnips, oats or barley, rye grass and clover, rye grass and clover. The grain and hay crops in this rotation have produced returns for the past four seasons, and are included with the feeding returns of grazing plots for 1921 in the next



table. Details of the seeding of these plots have already been given amongst the general crop report:—

*Six-course Rotation of Crops, Kybybolite, 1918-1921.*

Year.	Wheat.		Oats and Vetches.		Turnips. Sheep per Acre.	Oats.		Rye Grass and Clover. Sheep per Acre.	Rye Grass and Clover. Sheep per Acre.
	B. L.		T. C. L.			B. L.			
1918 . . .	(9A) 8 11	(9B) 0 14 12			—	(9D) 9 4		—	—
1919 . . .	(9F) 11 19	(9A) 0 10 56			—	(9C) 13 17		—	—
1920 . . .	(9E) 15 24	(9F) 1 15 92			—	(9B) 11 21		—	—
1921 . . .	(9D) 12 6	(9E) 1 13 35	(9F) 2.98	(9A) 6 22		(9B) 1.88	(9C) 1.91		
Means . .	11 45	1 3 49				10 6			

*Rotation C.*—Four-course, with 4-acre fields of crop in the Norfolk routine, viz.:—Turnips, oats, peas, wheat. The returns of wheat and oats have been very satisfactory to date from this rotation, and as practically all four fields carry some of our best soil it is disappointing that the pea crops have not yielded better. The following table shows returns for the past three years:—

*Four-course Rotation of Crops, Kybybolite, 1919-1921.*

Year.	Peas.		Wheat.		Turnips. Sheep per Acre.	Oats.	
	B. L.		B. L.			B. L.	
1919 . . . . .	(4D) 2 31	(4A) 29 26			—	(4C) 17 4	
1920 . . . . .	(4C) 1 32	(4D) 29 50			—	(4B) 32 27	
1921 . . . . .	(4B) 3 14	(4C) 8 40	(4D) 1.74	(4A) Destroyed by caterpillars			
Means . . . .	2 26	22 39				24 35	

*Rotation D.*—Six-course, with 9-acre fields cropped as follows:—Peas, wheat, turnips, oats (hay), clover (followed by summer crop), barley. This rotation has been under test for only two seasons, and returns to date are as follows:—

*Six-course Rotation of Crops, Kybybolite, 1920-1921.*

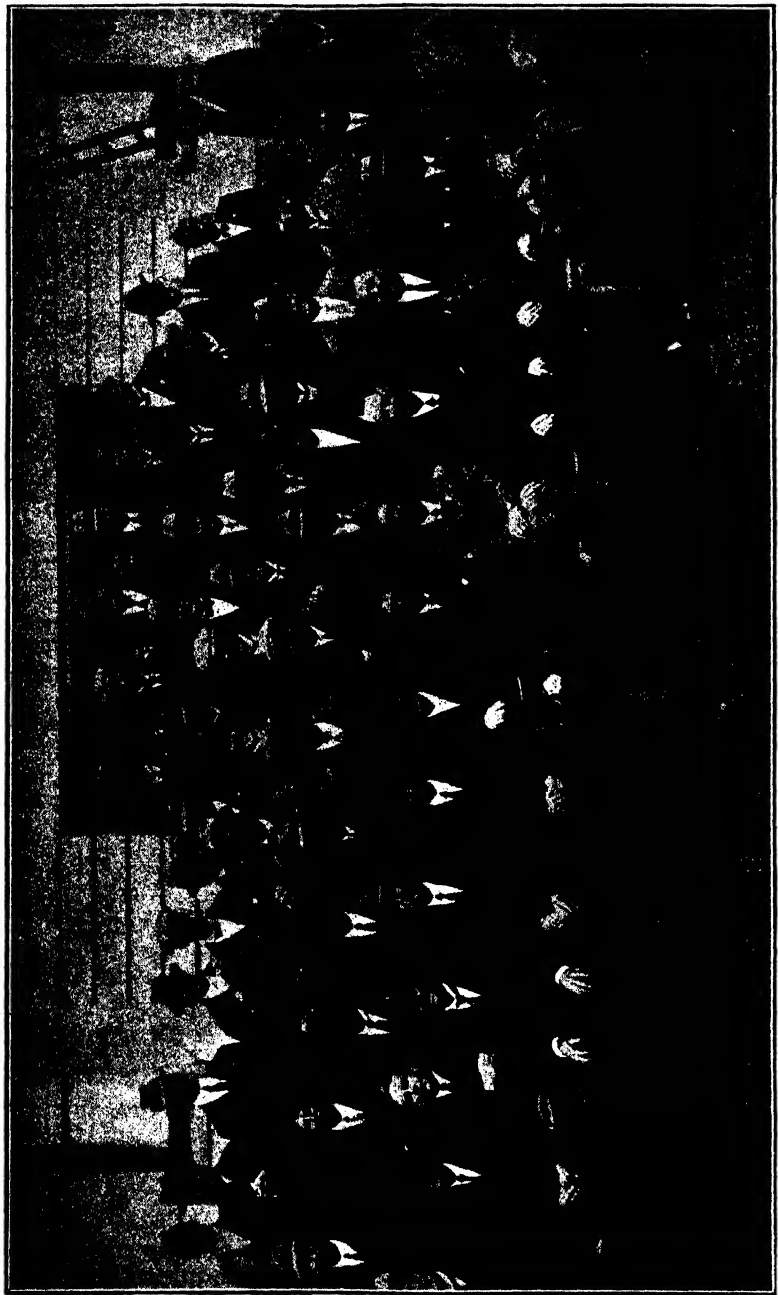
Year.	Peas.		Wheat.		Turnips. Sheep per Acre.	Oaten Hay.		Clover. Sheep per Acre.	Barley.
	B. L.		B. L.			T. C. L.			B. L.
1920 . . . .	(6F) Failure	(6A) 17 59			—	(6C) 1 5 5		—	(6E) 6 18
1921 . . . .	(6E) 13 5	(6F) 18 44	(6A) 1.75	(6B) 1 2 32		(6C) 1.98	(6D) 5 7		
Means . .	6 32	18 21				1 3 74			5 37

Finally, maize has been grown for grain under irrigation, but as the harvesting of this is not yet completed, a special report will be made later on the irrigation experiments.

## THE AGRICULTURAL BUREAU.

### CONFERENCE OF RIVER MURRAY BRANCHES.

The Annual Conference of River Murray Branches of the Agricultural Bureau was held in the Rivoli Theatre at Berri on Thursday and Friday, May 11th and 12th, 1922, there being present the Chairman of the Advisory Board (Mr. C. J. Tuckwell), the Director of Agriculture (Professor Arthur J. Perkins), Messrs. H. Wicks and F. Coleman (members of the Advisory Board of Agriculture), Mr. C. G. Savage (Manager of the Berri Experimental Orchard), Mr. S. McIntosh (Director of Irrigation), Mr. W. Muspratt (Irrigation Instructor), Mr. V. Cock (District Irrigation Officer), the Secretary of the Advisory Board (Mr. H. J. Finnis), and a large number of delegates and visitors. The chair was occupied by Mr. E. J. Moritz (President of the Berri Branch), who, in opening the meeting, extended a welcome to the visitors, after which the opening ceremony was performed by the Chairman of the Advisory Board (Mr. C. J. Tuckwell). A paper, "By-products on Blocks," by Mr. A. von Bertouch (Winkie) concluded the morning session. In the afternoon Mr. W. Muspratt (Renmark) read a paper, "Drainage," following with one on "The Possibilities of the Dried Fruits Industry," by Mr. H. Levein (Berri). In the evening Mr. S. V. Fuller (Loxton) contributed a paper, "Fruit Bud Selection," and the Director of Agriculture (Professor Arthur J. Perkins) replied to a number of questions that had been submitted by the Glossop, Waikerie, and Berri Branches. On Friday morning Mr. G. W. Beverley (Loxton) read a paper, "Pruning the Sultana." The following resolutions were carried at the Free Parliament:—(a) "That it is the opinion of the Conference that it is most desirable that either the Horticultural Instructor (Mr. Geo. Quinn) or the Manager of the Berri Experimental Orchard (Mr. C. G. Savage) should be permitted to judge the forthcoming pruning competitions of the River Murray Branches of the Agricultural Bureau." (b) "That the Government be asked to consider the erection of a dehydrating plant at Barmera." (c) "That there should be no hard and fast rule as to the number of waterings in a year, and that a better method of irrigation be introduced on the river settlements." (d) "That it be a recommendation to the Minister of Agriculture that the scope of work at the Berri Experimental Orchard be increased." (e) "That the necessity for the preservation and regeneration of timber on the River Murray bends and flooded lands be brought before the Government." (f) "That it is in the interests of the dried fruits industry that greater care be exercised in the placing of drying grounds." (g) "That this Conference asks the Advisory Board to approach the Government with a view of having the Noxious Weeds Act more rigidly enforced." (h) "That this Conference records its regret at the departure of Mr. G. W. Beverley, of the Loxton Branch of the Agricultural Bureau, and it appreciates to the fullest extent the great services that have been rendered by Mr. Beverley to the horticulturists along the River Murray, and wishes him, his wife, and his children every good wish for the future." On Friday afternoon the visitors made a tour of Berri and surrounding settlements in motor cars provided by members of the local Branch.



Some of the Delegates and Officers of the Department of Agriculture who attended the 1922 Conference of the River Murray Branches of the Agricultural Bureau.

## POMOLOGICAL CONFERENCE.

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The eighth annual meeting of the Pomological Committee of Australia, which began on Monday, May 15th, was concluded on Tuesday afternoon, May 16th. Mr. H. Wicks (South Australia), who was elected President in succession to Lieut.-Col. J. N. Lang (Victoria), occupied the chair, and the other delegates present were:—South Australia—Messrs. G. Quinn (Government Horticulturist), C. G. Savage, A. B. Robin, W. C. Hackett, L. J. Wicks, W. Tilling, and R. Fowler (Acting Secretary); Victoria—Mr. F. E. Pescott, Lieut.-Col. J. N. Lang, Messrs. J. W. Lawrey, and A. B. Thiele; Tasmania—Hon. L. M. Shoobridge and Messrs. W. G. Gray and J. N. Ward; New South Wales—Messrs. W. J. Allen and O. W. E. Kirkness; Western Australia—Mr. G. Wickens (Chief Horticultural Officer). The committee examined over 50 seedlings, sent from the various States, but only one was considered worthy of recommendation for commercial purposes. This was raised by Mr. S. J. Kelleway, of Huon Valley, Tasmania. Many of the specimens had been before the committee on two or three previous occasions.

The chief matters which were discussed were "Blight-proof Apples," "Peaches for Canning," "Peaches and Apricots for Drying," "Pears for Drying," and the "Correct Nomenclature of the Trevatt Apricot." The question of suitable stocks was discussed at some length, but as conditions of soil and climate made results so variable, it was decided to recommend to the Australian Fruitgrowers' Conference that each State should be advised to make inquiries as to the stocks most suitable for its own particular conditions. It was reported by Mr. W. J. Allen, the New South Wales expert, that he had found nothing better for combating the woolly aphis disease in apples than a tobacco solution, obtained from soaking tobacco stems in cold water.

Progress reports were received from the various States in regard to new peaches for canning purposes, and warning was given against planting the variety known as Tuskena. It was stated, however, that growers should not confuse this with the Tuscan variety, which was one of the best for canning. The committee was unable to find any better apricots for drying purposes than the Moorpark, and the best peach for the purpose was considered to be the Elberta. In a report regarding the drying of pears, Mr. C. G. Savage (South Australia) stated that the Passan du Portugal dried out superior to the Williams, the variety which is at present extensively used for drying purposes. Furthermore, as the former variety ripens in succession to Williams, it was considered worth cultivating.

A pear disease, called for the want of a better name "black end," was brought under notice by Col. Lang, and it was decided that more information was required, and the matter was deferred until next conference, the various State departments to make inquiries, and bring reports, with specimens, if possible.

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## RIVER MURRAY HERD TESTING ASSOCIATION.

### RESULTS OF BUTTERFAT TESTS FOR FEBRUARY, 1922.

Herd No	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during February.	Per Cow during February.	Per Cow October to February.	Per Herd during February.	Per Cow during February.	Per Cow October to February.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/A	13-25	11-11	8,468-5	639-13	2,848-94	387-67	29-26	125-90
1/C	27	24-07	16,606-5	615-06	3,779-99	666-43	24-68	157-96
1/E	17-57	15-04	9,514	541-49	2,704-52	413-67	23-54	118-16
1/G	49-29	41	40,847-5	828-72	4,340-06	1,572-26	31-90	168-19
1/I	10	7-93	5,587	558-70	3,455-85	238-45	23-85	147-70
1/J	18	16	9,772	542-89	3,101-01	459-93	25-55	137-27
1/K	15	12-21	8,486	565-73	3,378-33	397-52	26-50	147-18
1/L	12-75	10-61	5,410	424-31	2,637-85	246-54	19-34	127-21
1/M	20	18-04	9,715-5	485-78	2,490-78	448-50	22-43	111-88
1/O	33	26-86	14,901-5	451-56	2,813-47	704-15	21-33	129-58
1/R	19	13-46	6,329	333-11	1,840-79	300-70	15-84	89-81
1/S	16	12-89	6,940-5	433-78	2,476-96	307-99	19-25	107-97
1/T	13	11-64	7,554-5	581-11	2,276-39	350-96	27-00	112-67
1/U	13-96	12-71	9,316	667-34	3,172-18	443-08	31-74	143-01
1/V	16	13-82	7,953	497-06	2,510-07	355-33	22-21	108-86
Mean	19-59	16-49	11,160-10	569-68	3,093-55	486-21	24-82	133-70

### ERADICATING COUCH GRASS.

Couch grass is an extremely difficult weed to control. Unless it is attacked when first it appears, cultivation very quickly leads to its distribution. The only sure way of eradicating it, known to the Department of Agriculture, is to dig and hand-pick it carefully. "In every case in which I have seen couch grass completely removed from land," says the Superintendent of Experimental Work (Mr. W. J. Spafford), "it has been done by digging and hand-picking. This is naturally a very laborious job, but it is in most cases worth while. The amount of hard work necessary can be considerably reduced by covering the grass patches with about 4in. to 6in. of straw in the spring, when the grass is growing. It will be found that many of the stems of the plants leave the soil and grow in the straw, which can then be raked up and burnt. Two applications like this will usually thin out the patches so much that the remainder can then be removed by hand fairly easily. The difficulty of killing the grass with poisons rests on the fact that very often the underground runners of the plant are down some distance in the soil (6in. to 9in.), and the whole soil to this depth must be saturated with the poison being used if success is to be achieved. I have seen many poisons tried, and not one of them has done more than thin out the plants, and besides the expense of the job, the treated patches remain sterile for years."

## ORCHARD NOTES FOR SOUTHERN DISTRICTS.

[By C. H. BEAUMONT, Orchard Instructor.]

*Pruning, Planting, Ploughing.*—These three most important orchard operations will be carried out during June.

Pruning is a subject on which experts differ, and others, who call themselves practical men, differ more, and have ideas peculiar to themselves. It is not possible, in these short notes, to explain methods of pruning; different districts demand a different treatment, and so do the varieties. But, as a general principle, we try to make the young trees strong, and we cut them back hard to definite buds for shape: we do not expect fruit from them. The mature trees we cut as lightly as possible, and try for a heavy crop. Do not make flat cuts; if you do, rain will lodge on them and cause the wood to rot. It is just as easy to make a sloping cut. Another thing to remember is that when you cut a limb off with a saw, be careful that it does not split away; finish the cut by trimming around the edge with a sharp knife; put a little paint over the whole cut to prevent weathering. Do not allow the top of the tree to get too dense, or you will get no fruit on the lower limbs. If you have some flowering peaches, cherries, &c., do not treat them as fruit trees; they are flowers, and should be pruned after the flowers are done. Keep all sick trees until last. Do not forget that you have an instructor in your district who is ready to give advice if required.

Planting is an operation requiring great care. It will depend materially on the planting whether you get a good tree or not, that is, if you plant a healthy young tree. Do not plant too deep, and be sure to spread the roots. Do not plant in wet soil.

Ploughing needs to be done thoroughly. Good cultivation materially assists the tree to produce good fruit.

*Olives.*—To pickle olives or to make olive oil is very simple; no olives should be wasted. Write to the office if you want to try oilmaking.

Keep the orchard well drained, and see that surface drains are cleaned out. Water must not remain about the trees.

*Woolly Aphis.*—Keep this down. Use "Black Leaf 40."

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#### TEMPORARY PREMISES—

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## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Monday, May 15th, there being present Mr. C. J. Tuckwell (Chairman), Professor Arthur J. Perkins (Director of Agriculture), Messrs. T. H. Williams, F. Coleman, A. M. Dawkins, W. J. Colebatch (Principal, Roseworthy Agricultural College), W. S. Kelly, Col. Rowell, and the Secretary (Mr. H. J. Finnis). An apology was received from Mr. H. Wicks.

*Compulsory Dipping of Sheep.*—A communication was received from the Gladstone Branch, intimating that the compulsory dipping of sheep was not being enforced in their district. The Chief Inspector of Stock (Mr. T. H. Williams) reported on the position as follows:—“Owing to the pressure of work in consequence of the numerous and scattered outbreaks of pleuro-pneumonia, the inspectors of stock could not devote the time required for a farm-to-farm inspection of sheep, and I have no doubt that some sheep owners failed to dip last season as they found their sheep clean. No lice-infected sheep have been found in the locality where the complaint arose for two years or more. I propose asking the Minister of Agriculture to vary the present proclamation so that a large area of the Mid-North will be left out of compulsory provisions.” The Secretary was instructed to advise the Gladstone Branch in terms of the Chief Inspector’s report.

*Rail Facilities for the Paringa Lines.*—Further correspondence relating to the difficulty settlers on the Paringa line were experiencing in securing trucks was received from the Nunkeri and Yurgo Branch. On the motion of Mr. A. M. Dawkins, seconded by Mr. F. Coleman, it was decided to send a copy of the correspondence received to the Railways Commissioner.

*Destruction of Rats.*—The Mount Barker Branch asked that the Advisory Board should urge the Government to place rats on the list of vermin. The Secretary was instructed to suggest to the Branch that they might communicate with the local district council, which body, it was believed, had power to enforce the destruction of these pests.

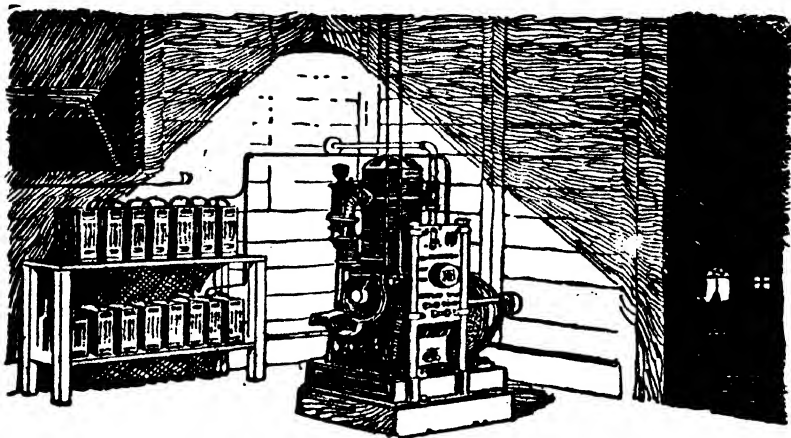
*Afforestation.*—On the motion of Mr. F. Coleman, seconded by Col. Rowell, it was resolved, “That it be a suggestion from this Board that the Conservator of Forests should be appointed as a member of the Advisory Board of Agriculture. Messrs. W. S. Kelly and A. M. Dawkins supported, and the motion was carried unanimously.

*River Murray Pruning Competitions.*—The 1922 Conference of River Murray Branches carried the following resolution:—“That it is the opinion of this Conference that it is most desirable that either the Horticultural Instructor (Mr. G. Quinn) or the Manager of the Berri Experimental Orchard (Mr. C. G. Savage) should be permitted to judge the forthcoming pruning competitions.” This matter was dealt with at a previous meeting of the Board, when it was pointed out



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that it was inadvisable for Government officials to take the position of judges in competitions and shows dealing with rural activities, but after hearing the report of the Chairman (Mr. C. J. Tuckwell), who attended the Conference, and reported on the great difficulty the orchardists were experiencing in obtaining competent judges, it was resolved, on the motion of Mr. W. S. Kelly and seconded by Col. Rowell, "That it is the opinion of the Board that either Mr. Quinn or Mr. Savage should undertake the judging of the competitions."

*The late Josiah Paull (Field Engineer of the Department of Agriculture).*—Letters of sympathy, expressing regret at the untimely decease of the above officer, were received from a number of Branches of the Agricultural Bureau. The Secretary was instructed to send a letter of condolence to Mrs. Paull and family, expressing sympathy in their sad bereavement.

*Enforcement of Noxious Weeds Act.*—The following resolution was received from the Loxton Branch:—"That the Advisory Board approach the Government with a view to having the Noxious Weeds Act rigorously enforced in the irrigation areas." It was stated that Bathurst Burr was spreading from the settlements into the adjoining sheep country, and causing much damage to the wool. The Board decided to ask the Government to enforce the provisions of the Noxious Weeds Act outside the district council areas of the River Murray settlements.

*Destruction of Wild Onion.*—The Wudinna Branch reported that the plant locally known as wild onion was growing in the Warramboo railway station yard, and requested that steps should be taken to have the plants destroyed. On the suggestion of Professor Perkins, it was decided to ask the Branch to send a sample of the plant, with flowers, for identification.

*Rate of Carriage on Potatoes.*—A communication was received from the Rendelsham Branch, asking for a reduction of the rail freight on potatoes from South-Eastern stations to Adelaide. It was decided that the matter should be placed before the Railways Commissioner, with the support of the Board, pointing out the difference in freight on the South Australian and Victorian railways for potatoes, and requesting that if possible the Commissioner should meet the desires of the Rendelsham Branch.

*Production of Seed Wheat on Experimental Farms.*—The Clanfield Branch resolved, "That the Advisory Board be requested to approach the Government with a view of having larger areas of the Government Experimental Farms used for the production of stud seeds, and thus be in a position to supply farmers with reliable seed." It was decided to transmit the resolution to the Minister of Agriculture, for his information.

*Resolution from South-Eastern Conference.*—The recent Conference of South-Eastern Branches carried the following resolution:—"That a Bill be introduced into Parliament to prevent the sale of adulterated bran and pollard." On the motion of Mr. W. J. Colebatch, it was decided to ask the Minister of Agriculture to forward the matter to

the Director of Chemistry, asking whether any instances of such adulteration had come under his notice, and if so, could he offer any suggestions to the Board as to how the matter might be regulated.

*Resolutions from River Murray Conference.*—(a) Location of drying grounds: "That it is in the best interests of the dried fruits industry that greater care should be exercised in the placing of drying grounds." It was decided to transmit the resolution to the Central Board of Health for an expression of opinion. (b) Experimental work at Berri Orchard: "That it be a recommendation to the Minister of Agriculture that the scope of work of the Berri Experimental Orchard be increased." It was decided to ask the Horticultural Instructor (Mr. G. Quinn) for a report on this matter. (c) Water supply on irrigated settlements: "That there should be no hard and fast rule as to the number of waterings in the season, and that a better method of irrigation be introduced on the river settlements." The Secretary was instructed to submit the resolution to the Director of Irrigation for a report. (d) Dehydrating plant at Barmera: "That the Government be asked seriously to consider the erection of a dehydrating plant at Barmera." It was decided to forward the matter to the Minister, at the same time expressing the opinion that the recommendation suggested possibilities, and asking that the position might be investigated.

*New Members.*—The following names were added to the rolls of existing Branches:—Narrung—P. Hunt; Tarlee—T. E. Stribling, E. J. Thomas, W. H. Thomas, G. N. Willis, W. Willis, S. Willis, P. Buckley, J. Devine, M. Nash, J. J. O'Sullivan, G. Pillar, W. Potter, A. E. Reed, J. Sanders, H. Sanders, E. F. Kreig, W. S. Kelly, John Kelly, J. McInerney, L. Molineaux, A. L. Molineaux, G. Minchin, A. M. Fuller, E. Humphries, H. Humphries, A. T. Hill, T. Hooking, P. J. Hogan, R. G. Jackson, E. A. Clarke, Eric Clarke, G. Cornish, L. E. Clarkson, H. E. Clarkson, W. Dawson, W. E. Edgerley, S. Arthur, G. Arthur, W. C. Branson, M. Badman, Angus Clarke, D. L. Clarke, Allan S. Clarke; Strathalbyn—H. Dunchue, V. J. Hill, D. Westwood, D. W. L. Freestun; Crystal Brook—W. L. R. Hamlyn; Willowie—R. C. Starkey; Pygery—G. Day; Lamerook—L. J. Koch; Clanfield—W. Taylor; Block E—E. Huselius, P. C. Andrew, H. W. Overland, R. J. Ranger, C. L. Ashenden; Mypolonga—D. J. West; Clare—S. Maynard, F. W. Knappstein; Mount Gambier—C. A. Preece, S. Thompson; Tarcowie—A. E. Bowley; Waikerie—G. Honola, E. W. Ohlmyer, W. Garwood, A. J. Ekins, G. Coventry, J. Virgo; Cadell—C. B. Basham, H. B. Basham, R. Conway, T. Dalzell, R. Duncan, W. Blight; Windsor—H. Schlodder; Lone Gum—E. F. Harling, H. K. Traeger, D. Fisher; Balaklava—H. B. Moody, G. Rundle, G. Rivett; Booleroo Centre—C. W. Peterson; Bundaleer Springs—T. O'Dea, — McEvoy, T. Casey, C. Moy; Cleve—W. Elson; Taplan—R. W. J. Clark; Borrika—E. P. Wilhelm, J. McCrae, B. Strathearn; Artherton—J. R. Colliver; Murray Bridge—M. Bell, — Johns; Wynarka—G. R. B. Williams, J. H. Priest, E. W. Mewett, J. Brazil; Black Springs—J. Miller, G. Mattner; Clanfield—J. Haskell, G. Parkinson; Strathalbyn—E. C. Jenkins, J. Logan, G. Sissions; Moorook—A. Lamont, A. Dodson; Saddleworth—W. Parker, F. W. Coleman, J. Brown.

## THE AGRICULTURAL OUTLOOK.

## REPORTS FOR THE MONTH OF MAY.

The following reports on the general Agricultural condition and outlook of the areas represented by the Government Experimental Farms mentioned below have been prepared by the respective Managers:—

*Booborowie.*—Weather—The weather for May has been ideal, plenty of rain and, generally speaking, fine and warm, 373 points of rain having been registered up to the time of writing. Crops—The crops are germinating well, which could only be expected under such favorable conditions. Natural feed—Natural feed is plentiful, the grasses and herbage growing quickly for this locality. Stock are in practically the same condition as is usual for this time of the year, those being hand fed are looking well, whilst those roaming the roads are in poor condition. Pests—Rabbits are rather numerous in places, and many pests, in thistles, are to be seen coming up. Miscellaneous—Seeding is being proceeded with as rapidly as possible.

*Eyre Peninsula.*—Weather—Poor seeding weather, there only being light rains, which made the soil bad for malting. Crops—All sown except a few acres of barley on this farm. Most of the farmers are finishing in good time this year. Some crops up and looking fair, but they badly need a soaking rain. Natural feed—This also needs heavy rain. Some has commenced to come away, but is hanging fire now. Stock—All in good condition and free from disease. Pests—Rabbits commencing to come in again now the crops are coming up. Miscellaneous—Rabbits were given a severe poisoning in this district, and were very scarce.

*Kybybo'ite.*—Weather has been good; quite suitable for seeding operations. Good rains fell during the first week of the month, and nice showers have been received since; 218 points registered. Otherwise weather has been calm and warm, quite conducive to good germination and growth of crops. Crops—Seeding is well advanced. Crops are germinating well and early green feed making strong headway. Spring sown kale and turnips made strong growth during winter. Maize for grain has ripened. Feed coming strongly.

*Turretfield.*—Weather—This district has been favored with splendid seeding rains, 392 points being registered for the month. The rainfall, although heavy, did not wash the fallows. Crops—A large area of land is sown, and in many cases the wheat plant is looking extremely healthy. Early sown crops show a fair amount of rubbish amongst the wheat. Natural feed—Grass is making nice growth, and will do well if no heavy frosts are experienced. Stock are not in so good a condition this year as they were last. There does not seem to be the same nourishment in the fodder. Pests—The lucerne flea has again made its appearance, and is affecting barley, lucerne, and other plants.

*Veitch.*—Weather has been mild and warm for May. Experienced good rains throughout the district; Veitch gauge registered 269 points to date. Crops—All cereals have germinated well, and early-sown fields have a very even start. Natural feed—Not much available at present, but a few weeks will give good feed. Stock are all in healthy condition. Pests—Rabbits are rather numerous. Miscellaneous—A large quantity of wheat and wood is being trucked on this line.

## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on June 1st, 1922:—

**BUTTER.**—During the month of May excellent general rains were recorded in most of the dairying areas. This is very gratifying for those interested in the dairying industry, and as no cold weather was experienced to check the growth, increases in supplies of both cream and butter have been noticeable, and it is expected that in a very short time South Australia will be self-supporting again. Given anything like mild weather, there should be a surplus for export towards the end of June. Prospects continue to look good for the opening of the season for export to London, and already our representatives in Great Britain are asking for quotations. At the close of the month first grade to choicest factory and creamery fresh butter in bulk sold from 1s. 9½d. to 1s. 10d.; best private separators and dairies, 1s. 7d. to 1s. 8d.; fair quality, 1s. 4d. to 1s. 6d.; store and collectors', 11d. to 1s. 2d.

**EGGS.**—Owing to the wet, cold weather supplies have shown a natural shrinkage, with the result that prices firmed considerably. Difficulty has been experienced in supplying trade wants. At close of period fresh hen sold at 2s. 2d.; duck, 2s. 3d.

**CHEESE.**—Values have kept up well considering the quantities that are offering, both of cold stored and new makes, but at close of period rates eased slightly, range being from 8½d. to 9½d., for large to small sizes.

**HONEY.**—Heavy quantities have come forward, but where quality was right, good clearances have been effected. Second grades have been slow of sale even at low figures. Prime clear extracted at end of month sold at 3½d. to 3¾d.; second grades, 2d. to 2½d. Beeswax saleable at 1s. 8d. to 1s. 9d. for clear samples.

**ALMONDS.**—Prices have shown a slight fluctuation, but there has been a good local and export trade passing, so that stocks have not accumulated. Brandis selling at 12d. to 12½d.; mixed softshells, 11d. to 11½d.; hardshells, 5d. to 5½d.; kernels, 2s.

**BACON.**—This line is receiving fair attention, both for local and export trade, and good business has been put through, best factory-cured sides selling at 11½d. to 1s.; middles, 1s. 1d. to 1s. 2d.; but hams are rather slow of sale at 1s. 1d. to 1s. 2d. Lard in packets, 7½d.; bulk, 7d.

**LIVE POULTRY.**—Following on the Easter sales, supplies usually fall off to some extent, but this year has been an exception, for heavy quantities have continued to come forward, and the pleasing feature is that an active demand has ruled throughout at our auctions, and satisfactory prices have been secured for consignors. Crates obtainable on application. At close of month rates were:—Prime roosters, 3s. 9d. to 6s.; nice conditioned cockerels, 2s. 9d. to 3s. 6d.; plump hens, 3s. 3d. to 5s.; medium hens, 2s. 3d. to 3s. 2d. (some light birds lower); ducks, prime conditioned, 3s. 6d. to 5s. 6d.; fair conditioned, 2s. to 3s. 3d.; geese, worth up to 7s.; turkeys, prime conditioned, 11d. to 1s. 4d. per lb. live weight; fair conditioned, 9d. to 10½d. per lb.; fattening sorts lower. Pigeons, 6d.

**POTATOES.**—Trade in this line has been steady during the past month, supplies being heavy and prices have shown very little fluctuation throughout. Millicent Redskins are worth from £3 5s. to £3 10s. on trucks Millicent, and Snowflakes from £3 15s. to £4 2s. 6d.; Victorian Carmens, £7 to £8 per ton on trucks Mile End.

**ONIONS.**—These have firmed a little since last report, but it does not look as though there will be any further increase in values, as forwardings are ample for requirements. Market at close of month was 8s. to 8s. 6d. per cwt. on trucks Mile End.

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of May, 1922, also the average precipitation to the end of May, and the average annual rainfall.

Station.	For May, 1922.	To end May, 1922.	A'v'ge. to end May, 1922.	A'v'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.				
Oodnadatta .....	0.67	3.30	2.31	4.83
Marree .....	0.49	1.80	2.56	6.10
Farina .....	0.91	2.52	2.92	6.73
Copley .....	0.81	2.07	3.64	8.45
Beltana .....	0.91	2.92	3.77	9.01
Blinman .....	0.77	3.14	4.92	12.62
Tarcoola .....	0.51	1.47	2.08	7.59
Hookina .....	5.97	6.99	4.30	13.30
Hawker .....	6.11	7.06	4.08	12.72
Wilson .....	4.73	6.06	4.05	12.33
Gordon .....	3.61	5.00	3.77	11.05
Quorn .....	3.15	4.69	4.47	14.60
Port Augusta .....	3.42	5.02	3.70	9.54
Port Augusta West .....	3.48	4.89	3.32	9.53
Bruce .....	2.86	4.50	3.38	10.40
Hammond .....	3.10	4.87	4.01	11.61
Wilmington .....	4.00	7.38	5.80	18.17
Willowie .....	4.54	6.67	3.93	12.16
Melrose .....	5.91	10.18	7.46	23.21
Booleroo Centre .....	4.06	6.19	4.89	15.53
Port Germein .....	3.98	5.60	4.59	12.79
Wirrabara .....	4.59	6.19	5.97	19.62
Appila .....	3.66	5.19	5.91	14.98
Craddock .....	5.63	6.52	3.76	11.18
Carrieton .....	3.68	5.33	4.10	12.63
Johnburg .....	4.95	6.39	3.45	10.50
Eurelia .....	3.49	5.22	4.25	13.36
Orroroo .....	3.07	5.56	4.66	13.57
Nackara .....	5.35	7.33	4.17	11.33
Black Rock .....	3.36	5.36	4.28	12.51
Ucolta .....	2.58	4.29	4.05	11.90
Peterborough .....	2.82	5.13	5.86	13.43
Yongala .....	3.65	5.26	4.53	14.41
LOWER NORTH-EAST.				
Yunta .....	1.83	2.59	3.52	8.75
Waukaringa .....	1.60	1.99	3.16	8.41
Mannahill .....	0.45	1.19	3.36	8.54
Cookburn .....	0.95	2.24	4.09	8.22
Broken Hill, N.S.W. ....	0.92	2.97	—	9.91
LOWER NORTH.				
Port Pirie .....	4.91	6.35	4.74	13.36
Port Broughton .....	4.35	6.16	4.69	14.18
Bute .....	3.16	5.40	4.86	15.65
Laura .....	5.16	8.26	5.53	18.16
Caltowie .....	5.11	7.89	5.32	17.07
Jamesstown .....	4.34	7.82	5.25	17.74
Bundaleer W. Wks. ....	4.82	7.23	4.92	17.89
Gladstone .....	5.06	8.39	4.95	16.13
Crystal Brook .....	4.47	7.25	5.07	15.74
Georgetown .....	5.81	9.40	5.79	18.44
Narridy .....	4.48	6.11	5.23	16.41
Redhill .....	3.50	6.14	5.26	16.75
LOWER NORTH—continued.				
Spalding .....	4.13	7.06	5.41	20.33
Gulnare .....	5.17	7.96	5.12	19.23
Yacka .....	3.62	5.76	4.61	15.34
Koolunga .....	3.34	5.80	4.66	15.79
Snowtown .....	3.78	6.04	5.10	15.95
Brinkworth .....	3.75	5.38	4.55	16.16
Blyth .....	3.15	5.55	5.44	16.75
Clare .....	4.73	8.87	7.55	24.51
Mintaro .....	4.99	9.21	6.43	23.26
Watervale .....	4.97	10.28	8.25	27.41
Auburn .....	4.21	9.09	7.63	24.25
Hovleto .....	3.55	6.44	5.73	17.79
Balaklava .....	3.45	5.32	5.39	15.87
Port Wakefield .....	2.01	3.85	5.03	13.19
Terowie .....	2.63	6.17	4.36	13.67
Yarcowie .....	4.58	9.30	4.54	14.06
Hallett .....	3.56	5.12	4.76	16.37
Mount Bryan .....	4.21	7.11	4.50	16.54
Burra .....	4.44	7.86	5.51	17.96
Farrell's Flat .....	4.32	7.04	5.70	18.90
WEST OF MURRAY RANGE.				
Manoora .....	4.68	7.76	3.48	18.63
Saddleworth .....	4.22	8.01	6.35	19.70
Marrabel .....	4.05	8.29	5.72	19.55
Riverton .....	4.13	8.29	6.55	20.66
Tarlee .....	4.27	6.90	5.74	17.75
Stockport .....	4.10	6.58	5.05	16.34
Hamley Bridge .....	3.44	6.29	5.25	16.45
Kapunda .....	3.54	6.43	6.42	19.80
Freeling .....	4.54	7.18	5.55	17.82
Greenock .....	5.06	8.14	6.44	21.56
Truro .....	3.95	6.91	6.03	20.07
Stockwell .....	4.16	7.33	6.03	20.24
Nuriootpa .....	4.46	7.65	6.17	20.94
Angaston .....	5.54	9.49	6.60	22.44
Tanunda .....	5.16	9.22	6.83	22.17
Lyndoch .....	5.48	8.78	6.42	22.81
Williamstown .....	5.98	9.13	7.75	27.52
ADELAIDE PLAINS.				
Mallala .....	3.10	5.44	5.43	16.58
Roseworthy .....	3.32	5.62	5.42	17.27
Gawler .....	3.76	6.01	6.31	19.08
Two Wells .....	2.82	4.71	5.30	15.85
Virginia .....	2.73	4.81	5.72	17.32
Smithfield .....	3.84	5.33	5.35	17.15
Salisbury .....	4.24	6.86	6.14	18.49
North Adelaide .....	3.81	8.99	6.90	22.09
Adelaide .....	3.36	7.26	6.93	21.03
Glenelg .....	3.11	6.54	5.94	18.37
Brighton .....	3.62	7.09	6.55	21.24
Mitcham .....	5.63	11.92	7.27	23.92
Glen Osmond .....	4.75	11.33	7.89	25.74
Magill .....	5.14	10.10	8.07	25.27

## RAINFALL—continued.

Station.	For May, 1922.	To end May, 1922.	Av'ge. to end May, 1922.	Av'ge. Annual Rainfall
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## MOUNT LOFTY RANGES.

Teatree Gully .....	4.88	8.66	9.52	27.77
Stirling West .....	7.33	19.41	12.32	46.62
Uraidla .....	6.87	18.01	12.75	44.06
Clarendon .....	5.66	13.14	10.20	32.98
Morphett Vale .....	4.29	8.33	7.22	22.76
Noarlunga .....	3.21	5.82	6.47	20.27
Willunga .....	4.08	10.24	8.16	25.87
Aldinga .....	3.43	8.17	5.35	20.24
Myponga .....	5.24	10.00	8.16	28.44
Normanville .....	3.36	7.25	6.54	20.51
Yankalilla .....	3.84	9.09	7.36	22.99
Mount Pleasant .....	5.20	10.50	7.95	27.04
Birdwood .....	4.90	9.91	8.04	29.26
Gumeracha .....	4.99	11.41	9.61	33.25
Millbrook Reservoir .....	5.75	12.35	—	—
Tweedvale .....	4.82	10.31	9.47	35.54
Woodside .....	4.60	12.41	8.69	32.08
Ambleside .....	4.04	13.31	9.42	34.62
Nairne .....	2.70	8.39	8.38	28.43
Mount Barker .....	3.67	12.05	9.24	31.13
Echunga .....	3.79	10.98	9.94	32.91
Maaclesfield .....	3.00	8.90	8.85	30.53
Meadows .....	3.55	11.55	10.58	36.04
Strathalbyn .....	1.43	5.19	6.22	19.26

## MURRAY FLATS AND VALLEY.

Meningie .....	4.10	7.68	5.92	18.66
Milang .....	1.83	4.86	5.14	15.42
Langhorne's Bridge .....	2.50	5.57	4.73	14.55
Wellington .....	2.48	4.95	4.91	14.68
Tallem Bend .....	2.50	4.53	4.84	14.11
Murray Bridge .....	2.61	4.23	4.77	13.83
Callington .....	2.05	4.09	5.14	15.37
Mannum .....	2.94	4.22	4.22	11.52
Palmer .....	2.34	4.04	4.47	15.24
Sedan .....	3.03	4.38	4.01	12.13
Swan Reach .....	3.15	4.40	3.59	10.82
Blanchetown .....	1.95	2.82	3.82	10.16
Eudunda .....	3.22	6.70	5.28	17.50
Sutherlands .....	3.29	5.02	3.24	10.92
Morgan .....	2.72	4.35	3.21	9.18
Waikerie .....	2.35	3.69	3.09	9.68
Overland Corner .....	2.32	4.13	3.99	11.08
Lorton .....	3.35	5.43	4.24	12.58
Renmark .....	2.58	5.21	3.68	11.02

## WEST OF SPENCER'S GULF.

Eucla .....	0.95	4.29	4.45	10.02
White Well .....	1.66	5.52	3.18	9.10
Powler's Bay .....	1.20	3.58	4.07	12.19
Penong .....	1.77	4.85	4.20	12.25
Ceduna .....	1.02	2.72	3.22	10.32
Smoky Bay .....	1.33	3.00	3.88	10.92
Petina .....	1.36	4.20	3.75	13.05
Streaky Bay .....	1.53	3.85	4.29	15.11
Talia .....	1.92	3.54	3.72	15.38
Port Elliot .....	2.52	4.72	4.49	16.53
Cummins .....	2.40	4.37	—	18.87

## WEST OF SPENCER'S GULF—continued.

Port Lincoln .....	1.71	4.64	5.78	19.75
Tumby .....	1.25	2.81	4.08	14.62
Carrow .....	0.96	1.72	4.07	14.64
Arno Bay .....	0.95	2.32	4.17	13.08
Cowell .....	0.59	1.46	3.38	11.52
Minnipa .....	1.28	2.82	—	—

## YORKE PENINSULA.

Wallaroo .....	2.59	4.18	5.03	14.09
Kadina .....	3.30	5.05	5.51	15.93
Moonta .....	2.69	4.44	5.39	15.25
Green's Plains .....	2.71	4.75	4.92	15.72
Maitland .....	3.54	6.23	6.39	20.05
Ardrossan .....	2.07	4.31	4.65	13.95
Port Victoria .....	3.00	5.54	5.11	15.35
Curramulka .....	2.31	5.60	5.51	18.16
Minlaton .....	2.83	6.34	5.47	17.79
Brentwood .....	1.94	5.04	4.74	15.54
Stansbury .....	2.01	5.53	5.31	16.96
Warooka .....	2.47	6.24	5.37	17.69
Yorketown .....	1.95	4.98	5.24	17.22
Edithburgh .....	1.76	5.36	5.27	16.53

## SOUTH AND SOUTH-EAST.

Cape Borda .....	3.38	7.29	7.21	25.01
Kingscote .....	1.62	4.80	5.94	19.01
Penneshaw .....	2.20	5.41	5.21	18.97
Victor Harbor .....	3.33	6.75	6.77	21.43
Port Elliot .....	3.03	6.09	6.47	20.00
Goolwa .....	2.75	5.17	5.94	17.83
Meribah .....	3.38	4.99	—	—
Mindarie .....	2.33	3.50	—	—
Karoonda .....	3.59	5.29	—	—
Pinnaroo .....	3.19	4.45	5.13	15.32
Parilla .....	3.14	5.06	4.30	14.39
Lameroo .....	3.11	5.54	4.94	16.27
Parrakie .....	2.68	4.69	4.36	14.27
Geranium .....	3.95	6.40	4.81	15.96
Peake .....	3.46	5.72	4.02	15.91
Cooke's Plains .....	3.40	5.94	4.59	14.84
Coomandook .....	3.47	6.13	5.21	17.31
Coonalpyn .....	3.39	6.18	5.26	17.44
Tintinara .....	4.19	6.35	5.49	18.54
Keith .....	4.30	7.10	5.37	18.19
Bordertown .....	2.22	4.41	5.87	19.44
Wolsley .....	2.22	4.03	5.38	18.06
Frances .....	2.75	5.52	—	—
Naracoorte .....	2.39	5.46	6.61	22.46
Penola .....	3.40	6.22	7.92	26.36
Lucindale .....	4.17	7.41	6.53	22.91
Kingston .....	6.07	10.36	7.27	24.44
Robe .....	4.92	8.42	7.28	24.58
Beachport .....	5.10	8.98	8.06	27.27
Millicent .....	5.33	9.87	9.03	29.37
Kalangadoo .....	5.50	9.56	—	—
Mount Gambier .....	4.47	7.92	9.89	31.46

## AGRICULTURAL BUREAU REPORTS.

## INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings		Branch.	Report on Page	Dates of Meetings	
		June.	July.			June.	July.
Alawoona .....	*	—	—	Eurelia .....	*	—	—
Aldinga .....	*	—	—	Frances .....	*	24	29
Amyton .....	†	—	—	Freeling .....	*	—	—
Angaston .....	*	—	—	Gawler River .....	*	12	10
Appila-Yarrowie .....	*	—	—	Georgetown .....	*	10	8
Arthurton .....	*	—	—	Geranium .....	1009	24	29
Ashbourne .....	1011	—	—	Gladstone .....	†	10	8
Balaklava .....	*	10	8	Glencoe .....	†	7	12
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Barmera .....	1009	6	4	Goode .....	†	—	—
Beetaloo Valley .....	988	—	10	Green Patch .....	*	5	3
Belalie North .....	*	10	8	Gumeracha .....	*	12	10
Berri .....	*	7	12	Halidon .....	*	—	—
Big Swamp .....	*	—	—	Hartley .....	*	—	—
Blackbeath .....	1017	10	8	Hawker .....	*	13	11
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Blackwood .....	†	19	17	Hookina .....	986	8	6
Block E .....	1006	—	—	Inman Valley .....	*	—	—
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Booloroo Centre .....	989	9	7	Julia .....	*	—	—
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Bundaleer Springs .....	*	—	—	Keith .....	*	—	—
Burra .....	*	—	—	Ki Ki .....	*	—	—
Bute .....	1000	6	4	Kilkerran .....	*	8	6
Butler .....	1000	12	10	Kimba .....	*	—	—
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\* No report received during the month of March.

† Held over until next month.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

HOOKINA (Average annual rainfall, 12in.).

May 11th.—Present: nine members and six visitors.

LAMB MARKING AND TAILING.—Mr. A. J. Heneschke, who read a paper dealing with this subject, expressed the opinion that lamb marking should be done when the oldest lambs were about six weeks old. Under usual conditions the ewes should all be finished lambing within six weeks, and any lamb that was two days old or more was fit to tail. Some people were of the opinion that a lamb was too young to tail until it was a fortnight or so old, but he had frequently noticed that a lamb of two days took less notice of the operation than an older one. When they were a couple of months old they received a severe check, whereas at six weeks and under they were affected for no more than about three days. The castrating and tailing should both be done at the one time, as the lamb would be considerably knocked about if put through the two operations with an interval of a day or two between them. A sharp knife, sterilised beforehand, was the quickest and best tool to use, and a healing disinfectant should be used on the wound to keep the flies away. A dressing such as Stockholm tar and kerosine or Cooper's milk fluid would answer the purpose. In the discussion that followed, Mr. O. Lindblom considered tipping the purse a safer and quicker method of marking. Mr. Stone said it was a mistake to allow lambs to go without tailing until they were a couple of months old, as at that age the operation sometimes had rather severe effects. Mr. Casey favored twisting the tails off, as no blood was lost, and the flesh was left to cover the bone. It was very simple and quick, and lambs suffered no ill effects. Mr. Casey explained that the operator caught the tail at the first or second joint between the first and second finger of the left hand and held it firmly. The tail was caught in a similar manner with the right hand as close as possible to the left hand. The right hand was given a quick half turn, and the tail was easily taken off. For marking, some members favored splitting the purse; it gave a good drainage, and it was very rare that a clot of blood would remain in the purse. It also gave the sheep a better appearance in the market. Mr. O. Lindblom wished to know if members thought rabbits could be poisoned with phosphorus now that the green feed had started. Mr. B. Murphy said he had used the poison cart only a couple of days previously, and never had better results.

MORCHARD (Average annual rainfall, 13.50in.).

May 6th.—Present: nine members and visitors.

SEEDING.—Mr. H. Kupke, who contributed a paper on this subject, referred to local conditions that obtained during the seeding operations on the farm. First, it was most necessary that the fallow should be in tip-top condition, and to obtain that it was necessary that the land should be worked with a spring-tooth cultivator after every rain up to or over  $\frac{1}{2}$  in. had fallen. When the actual seeding work commenced in earnest the farmer should be careful not to sow the grain when the land was in a very wet condition, or a poor germination would result. If such a condition existed, and one was compelled to push on with seeding on account of the lateness of the season, he had found that by running the harrows over the

land so soon as it was fairly dry, some degree of mellowness could be brought back to the soil. He favored sowing the seed at a depth of from  $\frac{1}{2}$  in. to 1 in. Early and dry seeding did not give very good returns in that district, and he had found by sowing the late varieties of wheat early, and the early sorts towards the end of May and June, with a fairly large dressing of guano manure, that the best results were obtained. He was convinced that if heavier dressings of super were used, say, from 90 lbs. to 150 lbs. to the acre, better crops would be returned, and the feed in the stubbles would be improved very considerably. Mr. A. Piggott also read a paper on "Fallowing," in which he said fallowing should be started early, with plenty of horse strength; at least two horses to a furrow. The land should be ploughed 4 in. deep, after which it should be worked with a spring-tooth cultivator, and then harrowed. He thought fallowing the most important work on the farm.

TARCOWIE (Average annual rainfall, about 15  $\frac{1}{2}$  in.).

May 9th.—Present: 12 members.

RABBIT DESTRUCTION.—In the course of a paper dealing with this subject, Mr. A. Watson said there were numerous methods adopted for the destruction of the rabbit pest, but he favored the poison cart, used at the end of summer, when there was little or no green feed about, particularly if the baits were laid just after a shower of rain. There was no danger from fire when using the prepared phosphorus poisons. In the winter, digging out the burrows or trapping were the best means to employ, and if wire-netting traps were used they need only be attended to once a day. Fumigation of the warrens was also a successful method of killing the rabbits in the burrows. It was a mistake to think that an occasional raid would clear the property of the pest. Only by a constant and united campaign would the rabbits be kept in check. In the discussion that followed, Mr. W. S.

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Ninnes said he had obtained results in killing rabbits by making a furrow with a plough and laying the baits by hand. He always prepared the baits at home by dissolving a stick of phosphorus in a pickle bottle filled with three parts of carbon bi-sulphide and one of water. Mr. Smith, in referring to rabbits in burrows in the banks of creeks, said he had been most successful with fumigation and blocking up the holes with old super bags.

ORROROO, April 8th.—The Hon. Secretary (Mr. J. J. Dennis) read a paper, "Excursion Railway Fares for Farmers," and a good discussion followed.

## MIDDLE-NORTH DISTRICT.

### (PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 23.50in.).

May 10th.—Present: 13 members and one visitor.

HORSEBREEDING.—Mr. E. H. Pearce contributed a paper on this subject. He thought the time was past when the horsebreeder was satisfied with stallions of indifferent breeds, but, owing to the great expense of procuring a first-class horse, there were very few pedigreed stock in the majority of districts to choose from. By using a good sire a better class of horse would be secured. The sire should be active, staunch, sound in every way, and quiet and good tempered. The mare also should be good tempered and sound. The foals should be bred early to get the benefit of the green feed. No good results could be attained, he said, with even the best stock without good feed. An interesting discussion followed the reading of the paper.

BLYTH (Average annual rainfall, 16.46in.).

May 6th.—Present: 15 members and visitors.

EXPERIMENTAL FRUITGROWING.—In the course of a paper under this heading, Mr. R. Buzacott said with a rainfall of about 17in. and the convenience of the Bundaleer water supply, it was surprising that farmers in the Blyth district had not laid out fruit and vegetable gardens on their holdings. Every farmer who had the land available should fence off and plant about half an acre of fruit trees. Half an acre of fruit trees would not take up very much of a farmer's time, for most of the work could be done with horses and implements. On the plains in their district the garden should have protection from the hot winds of summer and the cold winds of winter, either by planting a hedge or putting up a picket or paling fence. The sheds and stables could serve as a breakwind or a couple of rows of trees, not too close to the garden, would answer the purpose. He had experimented on a small scale with two cherry trees, which grew and came into bearing, but they ultimately died, he thought, because the climate and soil was not suitable for them. Apricots, nectarines, and early and late peaches grew well, making plenty of wood and yielding nice, clean fruit. Most varieties of vines did well on the plains, especially if given a couple of waterings during the year. During the year he had grown good crops of sweetwaters, muscatels, and ladies' fingers, but red prince did not do too well. The plum trees were not carrying a very heavy crop. He had also grown a few nice duchess pears. Neither his pear nor apple trees had made good wood. The orange and lemon trees had only returned a small crop of fruit. A mandarin tree which had grown into a well-formed tree had not up to the present been a heavy bearer. He thought vegetables that did not require too much water could be grown between the rows of trees. A mulberry tree had been planted about three years ago, but so far no fruit had set on it. Last year he planted a loquat tree, but it had made very little progress. Cotton threads spread over the tree had given the best results in keeping the sparrows away from the trees on a farm. The trees and vines should be planted far enough apart to enable the implements to work comfortably. The best results would be obtained with trellised vines. The ground should be prepared early in July. When pruning all the old wood should be cut out, and the trees kept well open, so that the sun and light could have free access

to the centre of the tree. He hoped the time was not far distant when every householder on the plains would have his own orchard. He did not advocate planting extensively, just simply a small home garden which would improve the appearance of the farm, increase the value of the property, and supply the household with fresh fruit.

**BOOLEROO CENTRE (Average annual rainfall, 15.83in.).**

April 14th.—Present: 12 members and two visitors.

**CARE AND FEEDING OF FARM HORSES.**—Mr. H. D. Michael, who contributed a paper on this subject, said the first essential point in the care of the farm horses was the erection of a good stable. The building should be constructed of iron and stone, and, if possible, a rising piece of land should be selected for the site. If the horses were kept in stalls it was necessary frequently to clean out the stables. Referring to the feeding of the animals, he considered the best means of bringing a ration of hay chaff to the correct standard was by the liberal addition of oats. An interesting discussion followed, in which Messrs. Paterson, Wibley, and Carey took part. Two members were nominated to attend the Short Course for Farmers at the Roseworthy Agricultural College.

**BOOLEROO CENTRE (Average annual rainfall, 15.83in.).**

May 5th.—Present: five members.

**CONSERVATION OF FODDER.**—In the course of a short paper dealing with this subject, Mr. H. Stephens said as much hay as possible should be cut, and if finances permitted, a mouse-proof enclosure for the stack should be erected. Cocky chaff had, on many occasions, proved a very valuable fodder during lean years, and it could easily be conserved by making it into heaps and covering it with straw. If the stubble from the past season's crop was good, it should be cut with the binder and built into a stack. After harvest the loose straw should be raked and stacked, and when cut into chaff and fed with molasses it made an excellent ration for spare stock. He believed if more fodder was conserved farmers would not have to send their stock into the markets, as was frequently the case when the prospects of the season were not too bright.

**NORTH BOOBOROWIE (Average annual rainfall, 16.35in.).**

May 10th.—Present: 12 members and two visitors.

**ROTATION OF CROPS.**—The following paper was read by the manager of the Booborowie Experimental Farm:—"Experience has shown that, by growing different kinds of crops in a particular order, reliable results may be looked for. In this way there have arisen recognised systems of cropping, which are called rotations. The advantages of rotations are:—(1) They result in crops of stronger vigor, for when crops of the same kind are grown continuously on the same land they are more liable to be attacked by disease. Repeated cropping of the same kind causes the crops to lose vigor, so that they are rendered less able to withstand such attacks. Therefore, it is wise to plant different kinds of crops on the land. This variation of cropping takes away the food of insects which infest a particular crop, so that, by the time this crop is grown again, the insects have either died out or have gone elsewhere in search of food. (2) They are economical of manure. Different crops require different kinds of manures, so that a variation in cropping allows plants of various orders a chance to take up the manurial foods in the respective proportions in which they require them. Thus a balance is maintained amongst the plant foods of the soil. (3) Well-arranged rotations permit of an economical distribution of labor. (4) Some varieties of plants, such as peas, store up food from the air and soil, which becomes available for the use of following crops. Root crops, though not suitable for this district, are restorative, not in themselves, but because they are usually fed to livestock upon the land. In this neighborhood we can very profitably substitute in place of roots a crop of cereals for grazing, such as a mixture of wheat 20lbs., barley 50lbs., and 80lbs. of oats, mixed evenly together, and sown at the rate of 150lbs. per acre, purely for grazing. In districts suitable for root crops, shallow-rooted crops are alternated for deep-rooted ones, because they draw their food from different regions of the soil. (5) A variety of crops is essential where cattle, sheep, and other livestock are kept.

There are many kinds of rotations, but, so far as my judgment and experience go, there are only two absolutely suitable to this locality—a three-course and four-course rotation. On the Government farm we have both a four-course and three-course, which were commenced in 1919 and 1920 respectively, and as you will note they have not been working sufficiently long in order to prove the advantages that I feel sure they eventually will prove, because in all agricultural experimental work a long period is required before definite data is obtained, and the longer land has been cropped the more organic matter will become used up, and it is the rotation cropping that will remedy this difficulty. So you will note the longer these systems of rotations have been carried out alongside the bare-fallow wheat system, the greater will be the advantages in favor of the rotation of crops. A distinct advantage in favor of a four-course rotation is, in districts where take-all is extremely difficult to combat, that it is one of the best methods by which one can properly control take-all. Bare-fallow, by shallow ploughing; second year, wheat, and shallow cultivations prior to sowing; third year, oats. First burn off the stubble, and only cultivate the land prior to sowing where practicable. Fourth year, burn the stubble again, and sow a grazing crop as previously mentioned, viz., wheat, oats, and barley, or any other suitable crop one chooses. In a four-course rotation, a valuable crop to grow the fourth year in this locality would be peas, for three reasons. First, the crop would add a valuable fertiliser to the soil in nitrogen; secondly, peas make a good grazing fodder, rich in nitrogen, and therefore good for growing lambs; and, thirdly, peas grow well in this locality so far as bulk is concerned; and by autumn sowing I think six profitable grain yields could be obtained out of nine crops, if grain was required. A suitable three-course rotation would be bare fallow, wheat, and oats or barley. I shall now give you some actual data recorded at the Government farm, by comparing yields of wheat from a three-course rotation—fallow, wheat, pasture, and no super, against bare fallow, wheat, no super, for the last six years in each instance. Bare fallow, wheat, and pasture has an average of 22bush. 37lbs. per acre; whilst that of bare fallow, wheat is 21bush. 55lbs. The yields for the above two plots for the single year 1921, bare fallow, wheat, pasture, no super, was 16bush. 44lbs.; and bare fallow, wheat, no super, 4bush. 17lbs. The bare fallow, no super plot was sown on May 27th, and the rotation plot sown on June 15th. So you will see, considering the weather conditions for the year 1921, the sowing time was in favor of the bare fallow, wheat plot, which had an advantage of 19 days earlier sowing over the bare fallow, wheat, pasture plot."

REDHILL (Average annual rainfall, 16.79in.).

May 16th.—Present: 10 members and visitors.

VEGETABLE GROWING.—A paper on this subject was contributed by Mr. F. C. Beech and read by Mr. A. B. Leaney. The writer said he intended to deal with those methods of vegetable cultivation that had proved successful in the Redhill district. If possible the land selected for the garden should have a slope towards the west and south, it should be ploughed as deeply as possible, and allowed to lie in a rough condition for a few weeks, after which it should be worked down to a fine tilth. When applying the manure he suggested that the stable refuse should be carted out on to the plot, spread evenly over the surface of the land to a depth of 6in., and then ploughed under. The first manuring could be made with straw manure fresh from the stable, but at the same time a heap should be made in a convenient spot in which manure to be used for future dressings was rotting. To prepare the compost, manure, soot, wood ashes, and vegetable matter should be banked around with soil and covered with a few inches of earth. The garden plot should be ploughed in November, and after the first rains there would be a good crop of weeds, which should be ploughed under. Any vacant land should be covered with a heavy mulch to prevent it from forming a hard surface crust. For breakwinds he suggested the planting of Kaffir apple or tamarisk. For raising seedlings a wooden frame of suitable size with a glass top should be placed firmly in the manure heap. Some of the soil from the manure should be removed, and tins containing the seeds then placed on the surface. It was also necessary to provide for ventilation and shade. With moderate waterings and shelter from the sun on very hot days, strong and healthy seedlings could be raised. In

outlining a course of work for the year, the writer said that during January Drumhead cabbage and Early Greenleaf cauliflower should be set, using a dibbler, and filling each hole with water. The plants should be puddled in, and if a mulch was placed around them they would immediately make good growth. All weeds should be kept in check. In February small quantities of carrot, lettuce, beet, turnip, swede, and early pea seeds, mixed with sand, could be sown in a shallow trench, and covered with a fine mulch of rotted manure to prevent the plants from wilting. A few early potatoes should also be sown. For that crop the land should be worked to a good depth, and equal quantities of super and wood ash added to the land. Each seed should have two eyes, and if cut seed was used the wound should be dipped in wood ashes. Immediately after planting, the bed should be covered with a thick mulch of manure. Cabbages and cauliflowers should also be planted out into permanent beds or furrows, the latter being filled in as the plants made headway. Swedes, turnips, and onions could be set out, and if frosts were not troublesome broad beans could be planted. Limo or super should be used for the latter crop. Strawberry runners should be planted out on a bed consisting of 75 per cent. of manure, and an addition of super would hasten the ripening of the fruit. If planted in rows, tomatoes could be set out later on in the season. During May, Yorkshire Hero peas could be sown. That crop gave best returns if super was added to the soil and the plants provided with a good mulch and plenty of shade. June was the best month for planting all fruit trees with the exception of citrus, which should be postponed until August. When planting the trees he suggested that a hole about a yard square should be made, and the subsoil broken up with a crowbar. The hole should be half filled with a mixture of rotted manure and sand, next a layer of good soil should be laid on, and the hole filled with water. After the earth had settled down, more soil should be added, and when all broken roots had been pruned from the roots of the tree it could be planted with the roots facing the direction from which the strongest winds were received. The hole should then be filled with sandy soil and packed tightly around the stem of the tree. A month later a heavy mulch should be applied, and when the roots had started to grow the branches should be pruned

### DIRECTOR, QUEENSLAND PRODUCERS' ASSOCIATION.

**A**PPPLICATIONS are invited for the position of Director of the Queensland Producers' Association. Commencing salary, £1,500 per annum; but if deemed necessary by the Council of Agriculture a higher commencing salary may be paid to any prospective appointee who may possess exceptional qualifications. The period of appointment will be three years, but the appointee will be eligible for re-appointment. The appointment will be terminable by three months' notice on either side. The appointee will be an Officer of the Queensland Producers' Association, and his primary duty will be to administer, subject to the general control of the Council of Agriculture, the affairs of the Producers' Association. Applicants should possess expert business, financial, and organising qualifications, and preference may be given to applicants who have had experience of co-operative undertakings and general directive work in connection with the agricultural industry. The successful applicant will be required to furnish a medical certificate of physical fitness.

Applications should contain full particulars as to name, age, qualifications, and experience of applicants, and should be accompanied by certified copies of testimonials. Applications should be forwarded to the Secretary, Public Service Commissioner (for transmission to the Council of Agriculture), and should reach him on or before June 30th, 1922.

H. DIGNAN, Acting Secretary.

Public Service Commissioner's Department, Queensland Government Insurance Building, George and Elizabeth Streets, Brisbane.

May 16th, 1922.

back to within 2ft. of the stem, leaving buds pointing outwards and upwards. If frosts were experienced the foliage of the tree should be sprinkled with water before the sun reached the leaves. During the same month the main crop of potatoes could be planted, and pruning should also be carried out. It would also be necessary to spray the trees for sucking insects, and the writer suggested the following preparation:—Half a pound of soft or common soap, placed in a kerosine bucket filled with water. This should be brought to the boil and continuously stirred, adding at the same time two tablespoonfuls of kerosine. For fungous diseases, 2lbs. of bluestone, 2lbs. of fresh lime, and 25galls. of water was recommended. During August, cucumbers, marrows, melons, and tomatoes could be sown in tins and placed on the manure heap. Onions should be planted out with a small quantity of manure, and a good mulch between the rows. White Spanish for immediate use and brown Spanish were advised for keeping purposes. All the bods intended for summer vegetables should be prepared by removing the soil and adding manure. Shorthorn carrots, rooted parsnips and turnips, and cabbages should be planted, and kidney and dwarf Canadian Wonder beans sown in September. During October all the summer plants should be hardened off from the frame and planted out into the prepared beds. Summer vegetables, in addition to Cape gooseberries, sweet corn, egg plants, and melons of all kinds could not have too much mulch applied to them during November. In the same month, guavas, passion fruit, &c., should also be heavily mulched. For the month of December there was little to do except the cultivation of salad vegetables in a bed prepared with sand and manure, and provision made for shade. The marrows, &c., should be fertilised, and the tomatoes prevented from making too much foliage. If locusts were troublesome, larkspurs should be pulled when in bloom, boiled down in water until the sap was extracted, and preserved by the addition of two teaspoonfuls of formalin to each gallon of solution. During an attack from grasshoppers the plants could be sprayed with the mixture, when it would be found that the pests would not touch those plants that had been treated.

WIRABARA (Average annual rainfall, 18.91in.).

May 6th.—Present: 10 members.

CARE OF SHEEP SKINS.—In the course of a paper dealing with this subject, Mr. A. M. Potts said there was no doubt that there was a considerable amount of money lost annually to the farmers through neglect in preparing skins for market. The animals should be killed on a draining board, to prevent blood from getting on to the wool, and the sheep skinned as soon as convenient in order that the blood would not collect in the veins and stain the pelt. Cutting the skin should be carefully avoided, because holes greatly decreased the value of the pelt. Shortly after the skin had been removed it should be painted with skin wash, to prevent weevils from damaging the pelt and wool. To obtain the best results in drying, the skin should be hung in the shade, lengthways over a beam, care being taken to see that the edges of the skin were kept straight and even. When dry, the skins should be taken from the beam and stacked one on top of the other, pelt to pelt and wool to wool, to prevent the pelt from cracking. Before packing for market, care should be exercised to see that the skins were thoroughly dry or there would be a danger of their becoming spoilt with mildew. When the skins were being baled the woolly side should be left facing outwards, and before wiring up a piece of bagging should be placed on the edges of the bale.

BLYTH, April 7th.—The Government Dairy Expert (Mr. P. H. Suter) visited the Branch and delivered an address, "The Dairying Industry." The meeting took the form of a social evening, and proved a very successful gathering.

## LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BLACK SPRINGS.

April 12th.—Present: 15 members and two visitors.

THE BEST BREED OF SHEEP FOR THE FARM.—In a short paper on this subject, Mr. W. Burbidge said every farmer should keep a small flock of sheep, and the breed most suitable for the Black Springs district he considered to be the Merino-Leicester cross. If the sheep were kept with a view of sending lambs to the market



he thought it would be better to cross the Merino with a Shropshire or Dorset Horn ram. The halfbred ewe made a good mother, and was more contented than the purebred Merino. The majority of people considered the crossbred a bad fencer, but if a good six-wire sheep-proof fence was erected, the animals would not cause any trouble.

**IMPROVING A NEW SELECTION.**—Mr. J. Fisher, who read a short paper dealing with this subject, said the improvements that were to be made to the new holding would naturally be governed to a large extent by the amount of capital that was available, but first consideration should be given to the selection of the site of the homestead and the water supply. The stables and implement sheds should be so situated that drainage from those buildings would not find its way into the dam. For the stable and the implement shed he suggested a structure 70ft. x 40ft. under one roof. The stable in the front could be 55ft. x 20ft., and would accommodate 20 horses. A chaff shed at the end 15ft. x 20ft., with the engine and cutter at the back, would leave a shed 55ft. x 20ft. for the implements. The building should be closed in at the back, and left open at the ends. The feeder in the stable should be so constructed that a person could walk behind the stalls with ease. The stables should be at least four chains from the homestead, and if a few trees were planted around the house they would add to the appearance of the property. For the boundary fences he suggested a fence 4ft. high, consisting of four plain and two barbed wires; five wires, including two barbs, should be sufficient for the division fences. In order to save time in travelling to and from work the holding should be divided into paddocks that would lead as close to the homestead as possible.

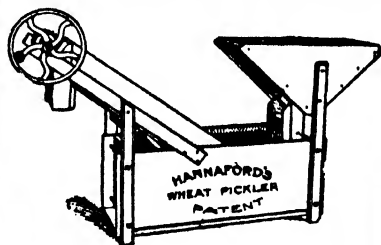
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## LONE PINE.

April 11th.—Present: 19 members and visitors.

**POULTRY ON THE FARM.**—Mr. E. R. Hentschke, who contributed a paper dealing with this subject, said on the average farm fowls were the most neglected part of the business. There were many farmers who carefully selected their more important stock for breeding and stated that it was necessary to be very careful in mating to get the best results, but so far as the fowls were concerned they did not trouble if they bred from the best breed or otherwise. It was essential that a farmer who intended to improve his stock should erect two or three breeding yards, and then try and secure some good breeding stock from a reliable poultry keeper. For laying purposes the writer preferred the White Leghorn, particularly as the hens were non-sitters, but it would be well to keep a heavy breed for hatching purposes if an incubator was not kept on the premises. It would be a good proposition for the farmer to have an incubator, so that the chickens could be hatched at the proper time, which should be August and September. It did not pay to keep a lot of old hens, from two to three years old was quite old enough, particularly if they were required for laying purposes. Sufficient young stock should be hatched each year to replace the old ones, and if that was done the farmer would greatly benefit by securing additional eggs for the same amount of feed given. The housing accommodation in most instances on the farm was sadly neglected, while in many cases the poultry perched on trees around the various stables, which were very often infested with tick and other vermin. The poultry shed should be kept free from all worms and tick, as those were responsible for nearly all poultry ailments. In conclusion, Mr. Hentschke stated that if the poultry section on the farm was only given a little more time and attention he was sure that it would prove to be one of the best paying businesses to the farmer in general. A lengthy and interesting discussion followed.

## OWEN.

May 12th.—Present: nine members and one visitor.

**DAIRYING AND PIGRAISING.**—Mr. C. L. Marshman, who contributed a paper on this subject, said the cow was a necessity on every farm, and also a very profitable sideline. He thought a farm of the average area should be able to carry three cows, but, of course, the number would be naturally governed by the size of the property and the labor available. For farm use the Jersey was recommended, and in a district such as theirs, that depended on sending the cream to the factory, a cow that produced a milk rich in cream content was required. If the milk was to be sold, then he thought the Friesian would be the best to keep. A cross between the two above-mentioned breeds should produce a cow that would be very useful on the farm. Next to the Jersey he favored the Ayrshire. Many people argued against the Jersey cow for the farm because they considered that after the cows had served their milking period on the farm they could not be easily sold to the butcher. That he considered to be a very poor argument. For instance, if a good Jersey cow was kept she should bring in at least £10 per year, and should be profitable for eight to ten years, thereby bringing in a profit of from £80 to £100. On the other hand, if a cow of a heavier breed was kept, she would only be a fair cream producer, and return, say, £7 per year, so that the farmer would be losing £30 for cream, which meant that a good price would have to be received for the "beefy" cow to equal the returns of the Jersey. Pure-bred Shorthorns were often good milkers, but the breed was recognised as a beef breed, and for general farm use he did not think they could be recommended. All stock required good shelter, and for that purpose he considered a straw stack to be ideal. The feeding of cows was a very important item in the profitable raising of dairy products. In a district such as theirs, where they did not have the facilities for growing lucerne to any extent, other methods would have to be adopted. He advised ploughing up a small paddock with the first autumn rains and cropping with malting barley. A larger paddock could be sown with Cape barley for the cows after they had eaten off the first paddock. When all the green feed had been utilised, oaten hay with bran, given at milking time, made an excellent ration. Salt licks should be kept in the feed boxes. A cow should not be milked right up to calving, but given a rest of at least four to six weeks, in order to give her time to recuperate before coming in. Cleanliness was most essential in the handling of all dairy products, and it was imperative that the

hands, milk utensils, and the udders of the cows should be thoroughly clean. Pig-raising on the farm as a side line was very profitable, even though the market fluctuated very considerably. He had been pigraising on the farm for over 10 years, and was able to show very good returns. It had been his custom to keep never more than five and seldom less than three breeding sows, and if the farmer intended to make pigraising pay he should be prepared to keep going, notwithstanding the state of the market. If a good breed of pigs had been built up it did not pay to sell out just because the pig market was dull; it was not an easy matter to pick up a good line of breeding sows. On the average farm he advocated keeping three good breeding sows. It was not so necessary to have the sows pure bred; have them three parts pure, but it was most necessary that the boar should be a pure-bred animal. Every farmer who had over three sows should keep a boar. It was not a good policy to have to rely on a neighbor for the use of his boar. It was not difficult to rear two litters in one year from each sow. Three sows should rear at least 50 pigs per year. If suckers were selling well, one might sell at that age. It was his opinion that they usually sold better or paid to sell as young porkers, if one had plenty of feed. Breed.—The best breed for farm pigbreeding was the Berkshire. The Berkshire was a good grower and also a good bacon pig, and always found a ready sale on any market. Berkshire-Poland China was a very good cross, but was not recognised as being so good as the pure Berkshire for bacon. If one wished to cross breed he suggested a Poland China sow with the Berkshire boar. Soaked malt barley he considered to be one of the best foods for pigs. A cask that would hold about three bags of barley should be obtained, and the grain covered with water, and soaked for two days; it would then be ready for feed. Malt barley could be grown very profitably on stubble ground, so that it made a very cheap feed. For

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fattening pigs for market pollard was one of the best feeds. He would not advocate keeping pigs in close sties all the year round. A better plan was to provide a small paddock of one acre or two acres and a straw stack. A small run for the sows that were to farrow, with a shed in it with straw sides, so that the pigs did not get smothered when the sow was farrowing, should also be provided. The large paddock should be ploughed up with the first rains in autumn, and sown with Cape barley. It was advisable to shut the pigs out of the paddock until the green feed was about 6in. high. Very often the green feed would grow more quickly than the pigs could eat it. If it reached ear development it would provide summer feed for the pigs. The barley should be sown about 3bush. to the acre. The young pigs should be weaned at eight weeks old, and the sow mated with the boar in three or four days. The sows should be in good condition before farrowing, as it was a big strain on a sow to feed, say, 10 young pigs for eight weeks. A good stone sty with a brick floor and plenty of ventilation, with good thatched roof, was necessary. Iron roofs were too hot. Mr. H. Bowyer, in opening the discussion, thought that a cross between a Jersey bull and Shorthorn cow was the ideal cross for a cow for general use on farms. Great care should be taken in selecting the bull, and attention paid to the young sire's mother, as to the shape of udder and size and placement of teats. It was a good plan to provide the cows with salt licks; it helped to keep them in good health, and prevented them from chewing old bones, which was very dangerous, especially if the bones were those from animals that had been poisoned. He also stated that it was natural for cows to eat long forage and roughage, and cattle thrived on that class of food better than on short feed. He thought barley hay almost as good as lucerne hay for cows. With regard to pigs, he favored the Mid-York sow crossed with the Poland China boar, or the Poland China sow and Berkshire boar. Mr. J. S. Lake thought that cows were a necessity on the farm, and it was just as well to keep good animals, and make that sideline as profitable as possible. He favored the dual purpose animal. With pigs he thought the crossbred sow and Berkshire boar threw a good class of pig. He considered that 110lbs. was heavy enough for a bacon pig, and it did not pay to keep them over that weight except for breeding purposes. Mr. J. Smith preferred the milking Shorthorn for a farmer's cow. He thought it best to feed cows on chaffed forage. Mr. T. A. Freebairn favored a half-bred Jersey mated with a Shorthorn bull. The calf from that cross sold well, and the cows were good milkers. He preferred the Berkshire pig, as they were easy to keep, and sold well. Mr. H. S. Harkness thought a Jersey-Shorthorn cow a good animal for general use. Such a beast had a good big frame, and gave a good supply of rich milk, and was also able to withstand adverse weather conditions. He did not think it advisable to allow the sow to become too fat before farrowing, especially in hot weather. As to weight for bacon pigs, 110lbs. to 120lbs. was, he thought, about the right weight. In selecting sires, great care should be taken, because the offspring would have at least half of the sire's characteristics. He thought greater stress should be laid on the sire's general appearance and its parents than pedigree.

#### WILLIAMSTOWN (WOMEN'S).

May 3rd.—Present: 13 members.

**BACON CURING.**—Mrs. Wild, who read a paper describing the process, said the carcass should be allowed to hang all night to set the meat. Next morning it should be cut into convenient pieces, as many bones as possible removed, and the joints broken before cutting up. The following recipe for dry salting was recommended:—2lbs. salt, 2lbs. brown sugar, 1lb. bi-carbonate of soda, ½lb. saltpetre, ½lb. ground cinnamon. Place the pork on a slab, cover with salt, and allow the meat to drain for two days. Then rub the mixture into the pork. Allow it to stand one day, and then pile the pieces one on top of the other. Turn every other day, adding more of the mixture as required. The bacon will take two weeks and hams four weeks to cure. Next soak the meat in clean, cold water all night, and then wash it in warm water. Finally rub well with olive oil and hang up to dry. To keep free from rust, store in a cool place in a box of bran. A good discussion followed.

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## WILLIAMSTOWN.

May 5th.—Present: 17 members and visitors.

**POTATO GROWING.**—Mr. E. D. Powell, who contributed a paper dealing with this subject, said for the spring planting the land should be ploughed to a depth of about 6in., harrowed, and then rolled. After a few weeks the cultivator harrows should be used, and the land again rolled. He expressed a preference for Up-to-date seed for spring planting. The seed should be spread out on a dry floor, two or three potatoes deep. The first shoots from the tubers should be rubbed off, and by the time the second shoots appeared the seed should be ready for planting. He favored small seed, but always made a practice of running a knife around the seed. For the summer planting the seed should be laid out on the floor during the winter months, and the shoots rubbed off at least three times before the potatoes were planted. The room should be well ventilated, to enable the seed to become thoroughly shrivelled and hardened. He considered Snowflake and Carmen the best two varieties for summer planting in the hills. The land should be ploughed three times before the seed was sown. Referring to manuring, the speaker said he could not speak in favor of stable manure for the reason that it carried too many fresh weed seeds to the soil. Bone super used at the rate of a bucketful of manure to a bucketful of seed potatoes had given him excellent yields. Strict attention should be paid to the saving of the seed if one intended to plant the next year's crop from potatoes grown on the property. He did not recommend planting the seed from consecutive crops on the same piece of ground for more than two seasons. An occasional change of seed would prove a very sound investment, and he made a practice of introducing fresh seed every year. The spring planting in their district should be carried out on sandy soil, because with the early summer rains the land was not inclined to set down so firmly around the plants on that class of soil. The summer planting, however, could be done on the heavier soils.

**VEGETABLE GROWING.**—Mr. J. Howarth, who read a paper on this subject, first dealt with the seed of cabbages, cauliflowers, and lettuces. The land for these, he said, should be worked one spade deep and well manured. The seed should be sown and a rake drawn backwards and forwards over the seed plot. Finally, the plot could be covered with sawdust or fine manure to prevent a hard crust from forming on the surface of the soil. For the first few times the plot should only be watered very lightly, but as the soil became settled, heavier applications could be made. If the weather had been warm and the plants watered twice a day, they should be ready to plant out in three weeks from the date of sowing. If the planting was performed during hot weather he usually made a practice of digging the ground and making holes where required with a dibbler. The holes should be filled with water some hours before the plants were set out, and the seedlings watered with a can until they were about a week old. Cabbages and cauliflowers should be set out 2ft. apart and 2ft. between the rows. For planting he recommended the following varieties:—Cauliflowers—Princess, Autumn Giant, and Early Green Leaf; and cabbages—Enfield Market, Savoy, Early Drumhead, and Henderson's Succession. The following varieties of lettuce were also recommended:—Winter planting—Neopolitan and Drumhead; summer planting—New York and Iceberg. If summer crops were sown, the plants should be set out in drains, and the water run under them, and in five weeks' time they should be ready for cutting. All of the above-mentioned varieties required plenty of stable manure. For winter planting the manure should be spread out over the land some time before it was cultivated. Carrots—The Shorthorn variety had given him the best returns. A trench 4in. wide and 1in. deep should be made, and the seed sown therein. The seed should be just covered with earth, and the trench filled up with sawdust. Deeply cultivated land, free from stones and stumps, was most essential for the successful cultivation of root crops. The speaker thought Hollow Crown parsnips and Egyptian beet root the best varieties for that district, while Golden Ball turnip could be depended upon for good crops. Carrots, parsnips, beet, and lettuce should, if possible, be planted in rows running north and south. There were many varieties of peas, but William Hurst had given the best yields on his property. He made a practice of sowing them in rows 2ft. apart.

LYNDOCH, May 11th.—Considerable discussion took place relating to the closing of the Turretfield Farm as a seed wheat farm. Arrangements for the forthcoming pruning competitions were also discussed, and a member read an article, "Ants versus Rabbits."

MALLALA, May 1st.—Mr. M. Ridgway (manager of Hugh V. McKay, Limited, Adelaide) attended the meeting, and delivered an address, "The Evolution of Australian Agricultural Machinery."

VIRGINIA, May 10th.—Mr. A. M. Dawkins (member of the Advisory Board of Agriculture) attended the meeting and delivered an address, "Diseases of Wheat."

WATERVALE, May 15th.—A general discussion took place on the subject, "Cost of Production of Wine Grapes." Mr. N. Reid was of the opinion that it would not pay to produce wine grapes in their district under present conditions unless £10 per ton was received from the winery. Members generally agreed with Mr. Reid's views. Other subjects of local interest were also brought forward for discussion.

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(TO BUTE.)

**BUTE, May 4th.**—An interesting discussion took place on the value of local experimental plots. One member was nominated for the Farmers' Short Course at the Roseworthy Agricultural College. Several other subjects of local importance were brought before the Branch.

**MAITLAND, May 6th.**—The President gave an interesting report of the recent Conference of Yorke Peninsula Branches that had been held at Moonta. Several other matters of local interest were brought before the meeting for discussion. It was decided that all future meetings of the Branch should be held on Thursday evenings on or before full moon.

**MOONTA, May 13th.**—The Chairman (Mr. A. B. Ferguson) gave an interesting account of a recent trip he had made, per motor car, through Eyre Peninsula.

**WESTERN DISTRICT.**

**BUTLER** (Average annual rainfall, 16.61in.).

April 10th.—Present: 18 members.

**BREAKING IN COLTS.**—Mr. R. L. Phillis contributed a paper on this subject. He said a strong yard would be needed, and if a crush pen was not available he would use a strong stall. After the horse had been driven into the stall a strong rope should be placed around its neck, and then a pair of winkers or a headstall. If a piece of rope was passed through the near side bit ring, under the jaw, and on to the off side ring, it would be found that the horse could be held without any difficulty. After a while the colt should be tied up to a post that he could not walk around, and he could then be rubbed down with a stick. The animal should then be run around in a circle, first one way and then the other. During the next day the young horse should be harnessed between two other quiet horses, and driven about to teach it when to stop and go forward. After that education the colt could be placed in the team for two or three hours. The speaker suggested that the horse should then be worked in a light implement for a few hours each day. The collar should be soaked in water overnight before being used, and it would then pull into the shape of the neck. Mr. Phillis advocated washing the horses' shoulders after removing the collar, as a preventive of sore shoulders.

**FIRE BREAKS.**—Mr. A. Tilly, in a paper on this subject, said it was almost impossible to make a fire break that would check all fires on any day, but as a precaution he suggested ploughing a strip of land six to 10 furrows wide around the crop during August or September, and using the cultivator when necessary to keep it bare of plant growth. If a break was made around every 100 acres, it would be very helpful for lighting against an approaching fire. For grazing paddocks he would plough six furrows as near the fence as possible, and then turn around and leave a few feet between the plough tracks. If there was a large number of stock on the land they would keep the tracks bare, but if the spring was very wet it should be ploughed up again. It was not wise, he said, to leave the ploughing of the breaks until the herbage was well advanced and becoming dry, because a great amount of work would be needed to clear the ground again. If sheep stations were divided into medium-sized blocks there would be less danger from fire, and a few men would be able to subdue what would otherwise be a large outbreak. A good discussion followed the reading of the paper.

**CLEVE.**

May 9th.—Present: eight members and visitors.

**CONVENIENCES FOR THE FARM HOUSEWIFE.**—Mr. S. H. Pearce, who contributed a paper dealing with this subject, said the average man who took up a new block was confronted with many difficulties, and it was necessary to dispense with many conveniences which were indispensable from an economic point of view; but even on well-established farms it was not uncommon to see the housewife still working without any home conveniences. The farmer's old plough had been replaced by a



new implement, but the wife still had to cook in a stove that had seen better days. The husband fed his horses in a convenient and dry stable, while the wife was asked to milk the cows in an open and dirty yard without any shelter. While the farmer had introduced numerous conveniences about the farm, his wife still swept an old asphalt floor, did the washing in the open, made the butter in a hot house, and was continually having to chase the cows out of the house yard because the fence required repairing. Such things, he believed, were due to a lack of thought on the part of the farmer rather than insufficient means to provide proper conveniences. The laying of water on to the kitchen and wash-house could easily be carried out by having the tank on a raised platform with a pipe running through the wall, and taps placed where they would be most convenient. Other conveniences for the kitchen that assist the housewife in the almost endless task of keeping the home tidy were proper cupboards and dish racks, and racks on which to hang the cooking utensils. When the time came for considering plans for the new home, too much thought could not be given to the site for the dwelling. The site selected should be one where good drainage and shelter could be obtained. A few hundred pounds spent in the building of a home with modern conveniences would be money well spent and thoroughly appreciated by the farmer's wife. Special attention should be paid to making the houses mouse and sparrow proof, and steps should be taken to reduce the dust nuisance to a minimum. If the kitchen walls were tiled to a height of 3ft. or 4ft. from the floor, the room could be kept clean with very little work, and the workshop of the house would always have a fresh and neat appearance. He did not think the time was very far distant when a country home would not be called complete unless it had a power installation for doing the washing, churning, separating, and ironing and lighting appliances, and be connected with the telephone. He believed if the man on the land endeavored to provide such conveniences as those he had mentioned in the paper, the drudgery of the housewife would be lessened,

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and a very important point in arresting the drift of the rural population to the city would have been made. A number of ladies were present, and an animated discussion followed the reading of the paper.

KOPPIO (Average annual rainfall, 22.40in.).

April 10th.

SMUT AND TREATMENT OF SEED WHEAT.—Mr. M. T. Gardner read a paper, in the course of which he dealt with three varieties of smut, viz., (1) bunt, or stinking smut, (2) loose smut, (3) flag smut, which caused damage to the wheat crops. The first named, he said, was the most harmful, the second was not so common, and very few complaints were heard of it reducing the yield of wheat to any great extent; the third, flag smut, was fairly common, and chiefly affected crops of a heavy, rank growth. Because of the fact that crops became infected with bunt, or stinking smut, through the distribution of spores of the disease with the seed wheat, it was most essential to have seed free of disease spores. When these were distributed with the seed, they germinated with the wheat, and developed tiny threads, which penetrated the roots of the wheat plant, existed as a parasite, and finally produced spores which displaced the wheat grain. Early-sown crops often escaped the disease, because at times the soil contained sufficient moisture to germinate the disease spores, but insufficient to cause the germination of the wheat grain. Hence, in the absence of a suitable host, the parasite perished. Continuing, the paper read:—"The smut spores can be killed to a great extent by the various forms of pickling with various chemical and mineral substances. Hot water has been used with good results, but this can only be recommended where special facilities are provided for the use of same. The most common form is pickling with copper sulphate solution (bluestone), 1 per cent. being considered sufficient under Australian conditions. After having seen pickling demonstrations, I have come to the conclusion that the best and only way of pickling grain thoroughly is by applying the solution in the form of a spray, and mixing and turning the seed with a shovel or other mechanical device on a floor, and so thoroughly wetting each and every particle of each grain. The small, hairy parts of the wheat grains make ideal resting places for the smut spores, and unless these parts are thoroughly wetted, and the smut spores adhering to them submerged in the solution, pickling will have been of no avail. Many farmers make a practice of dipping loosely tied butts of wheat in a 1 per cent. solution, and leaving them immersed for about 5mins. in the pickle. This is a very good and convenient way of handling the wheat, but sufficient force is not used to penetrate the whiskers on the grain, and, as can be seen by air pockets among the wheat, the grain has not been all wetted. Formalin has proved a very effective pickle in many cases,  $\frac{1}{2}$  per cent. solution being used, but as this is said to be subject to adulteration it cannot be recommended as being so sure as the old and well-known bluestone, with which we are all familiar. Flag smut can be cleaned from the land by burning stubbles and adopting a rotation of grain crops, fallowing, and later sowing. Care should be taken not to use smutty bags for seed and to thoroughly clean the seed attachments of the drill, and spray them with a bluestone solution."

McLACHLAN.

May 6th.—Present: seven members.

CARE OF FARM IMPLEMENTS.—Mr. E. D. Huppertz, in the course of a paper on this subject, first made reference to the plough and the cultivator. Neither of those implements, he said, required a great deal of attention, the main thing being to see that all the bolts and nuts were kept tight, and that the wheels were oiled regularly. Care should be taken when working the plough not to turn the corners too sharply, or there would be a danger of straining the implement. Should any of the bolts persist in working loose, the thread against the nut should be burred with a centre punch. The drill should be thoroughly overhauled before commencing the seeding. The stars should be removed from the drill and warmed in a fire, when the super could be removed from them without any difficulty. When left in the paddocks overnight, the drill should be covered, preferably with sheets of iron, and after the season's work had been completed the machine should be

put under cover, and the tubes taken off and placed in a bag in the seed box to prevent them from perishing. Stock should be taken of any parts required for next season, and the order placed with the agents without delay. The binder should be overhauled and placed in thorough working order before haycutting was commenced. After its work for the season was completed, it should be put under cover, and all the canvasses removed and hung up until they were required next year. The harvester was the most important machine on the farm, and required a good deal of attention. The beaters, dampweather, and fly wheel should be properly adjusted, and care taken not to have any of the bearings screwed up too tightly. The pinion and crown wheel should also receive due attention. It was a good plan to lift the main wheel and turn it slowly, when it could be noticed if the pinion was running true. Should the pinion show signs of wear a little oil should be applied. The driving belt should not be too tight; the application of resin would prevent it from slipping, and it would be found that the machine would run more easily with a loose belt. When the machine was started the belt should be pulled back into the clutch, so that all the parts would start work at the same moment, and when the machine was being stopped it should be thrown out of gear. He always made a practice of overhauling the machine when the horses were feeding. All parts should be kept well oiled, and when harvesting was completed the implement should be taken into a shed, the belts and sieves removed, and given a good coat of oil.

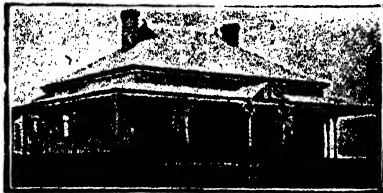
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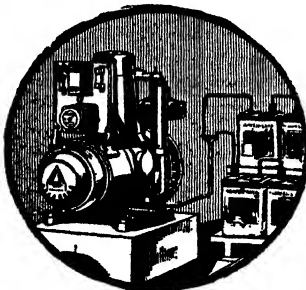
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## MOUNT HOPE.

May 6th.—Present: six members and three visitors.

A discussion took place on the subject, "How to Keep the Freezing Works at Port Lincoln Going at High Pressure when they are Established." Mr. R. L. Myers was of the opinion that in the past farmers had not paid enough attention to side lines, such as dairying, pig farming, and poultry raising. If the farmers adopted a systematic method of raising the livestock, he felt sure that they would have no trouble in keeping the works going. Continuing, he pointed out that barley, which was excellent pig feed, grew well in their district. He also stated that good crops of oats could be grown in the district. These, when cut for hay and chaffed up, would provide feed for hand feeding sheep. Mr. G. A. Vigar thought the management of the freezing works was working solely for the "off shears" sheep, which would only help the large shareholders, so he thought it was up to the small farmers to gradually enlarge on side lines, so that they could keep the factory going most of the time. Several other members spoke on the subject. Mr. J. H. Vigar tabled samples of Sudan grass, lucerne, and red beet. He was of the opinion that Sudan grass was not suitable for the coast country. He had great faith in lucerne, which could be grown without irrigation.

## O'LOUGHLIN.

April 12th.—Present: eight members and visitors.

HOMESTEAD MEETING.—The monthly meeting of the Branch was held at Mr. M. Kloeden's residence, when the subject, "Experimental Plots," was brought forward for discussion, and it was finally decided to hold a cropgrowing competition, each member to take part, and only members of this Branch be allowed to compete." The object in view is that each member shall experiment with not less than 50 acres, to see what results can be obtained from special care in cultivation, amount of super, selection of seed, &c. In was decided to ask Messrs. Foggo Bros. and Mr. Braumack to act as judges, that an entrance fee of 5s. be charged, and that a trophy valued at £3 3s. be awarded to the successful competitor. Mr. C. Bergmann read a paper, "The Boy on the Farm," which came in for a good discussion. The meeting closed with refreshments, that were kindly provided by Mrs. Kloeden.

## PYGERY.

May 6th.—Present: 11 members and visitors.

WORK ON A NEW SCRUB BLOCK.—Mr. G. T. Turley, who read a short paper on this subject, said the new settler should give first consideration to the erection of a rain shed and shelter for the implements. He thought it advisable to make the horse yards, feeders, and all outbuildings substantial, for there was no doubt that they would ultimately prove the cheapest and best. Seventy or 80 acres of the block should be logged or rolled without nicking with strong teams of bullocks, so that as many stumps as possible could be brought to the surface. A skim plough, harrows, and drill would be necessary to carry the settler through seeding operations, and 50 acres of wheat and 30 acres of oats should be sown for hay and seed for the next season. If the 80 acres of land were thoroughly worked, sufficient return should be received to carry over to the next year. After seeding, water catchments, such as a dam or cement tank, should be made. Then the work of clearing could be pushed forward, and the block ring-fenced so far as finances permitted. The main points for the new settler to bear in mind were to improve the water catchments and to push on with the work of clearing at every opportunity. In the discussion that followed, Mr. Ingram thought that before the ring-fence was erected, good fire breaks should be made. Mr. Kammerman considered that the new settler should clear at least 150 acres of scrub for the first year's seeding. Mr. Edmunds emphasised the necessity for clearing as much scrub as possible. He thought it was better to have light yields for a year or two than to handicap the work of clearing by paying too much attention to cultivation. The more land that was cleared the sooner would the farmer be able to carry livestock and fallow the land.

YADNARIE (Average annual rainfall, 14.09in.).

April 11th.—Present: 11 members and two visitors.

**FAT LAMBS.**—In the course of a paper under this title, Mr. A. C. Kruger expressed the opinion that the purebred Merino ewe was not suitable for the fat lamb market, but if she was crossed with either a Lincoln, Leicester, Border Leicester, or Romney Marsh ram a large-framed breeding ewe would be produced. For their district the speaker favored the Lincoln-Merino cross. The ewes from that cross mated with any of the Down breeds, preferably the Dorset Horn, would produce a lamb which at six months should weigh from 80lbs. to 100lbs. dressed weight. To obtain the best results, plenty of feed and a frequent change of pasture should be provided. Fifty acres of rape or barley, sown early and under favorable conditions, should provide feed for at least 350 lambs. If hand feeding had to be resorted to, he suggested oats. In the discussion that followed, Mr. J. J. Deer favored keeping Merino ewes, for one could then breed for both wool and mutton if the right cross was used. Mr. A. Spriggs said considerable care would have to be exercised when raising crossbred lambs, for only the best carcasses would be selected for the market, and the farmer would have the inferior animals left on his hands. Mr. J. E. Quick thought it advisable to specialise in either wool production or fat lambs. Mr. W. L. Brown said that both the Suffolk and Dorset Horn could be recommended for the export trade, but if wool-raising was the object in view, the Merinos should be kept separate from the other breeds. Mr. O. Forbes expressed a preference for the large-framed, bold-faced Merino ewe for breeding purposes. He was of the opinion that rape was worthy of a trial as a grazing crop for the sheep in that district.

**RABBIT TRAPPING.**—Mr. F. W. Jericho, who contributed a short paper on this subject, said every trap should have a spring under the large plate to prevent it from shutting when the rabbit placed its foot on the small plate which held the larger plate in position whilst the trap was being set. It was important that the trap should be set firmly in the ground, and it could be set at any distance from the burrow, but the earth should be levelled off at least 6in. in front of the trap. If the traps were to be set in places where there were no burrows, a cross 3in. deep, 4in. wide, and 2ft. or 3ft. long should be cut out of the ground, and the trap placed in the ground at the centre of the cross. A piece of No. 6 gauge steel wire could be used for pegging the traps to the ground. Mr. Jericho tabled a number of traps that were fitted with a small spring attached under the plate to keep the trap in position whilst it was being set.

#### YEELANNA.

May 6th.—Present: 10 members.

**SIDE LINES.**—"I think the time is fast approaching, if it is not already here, when more attention will have to be paid to side lines that can be run successfully in conjunction with wheat farming," said Mr. L. B. Smith, in a paper under the above heading. At present the main crop under cultivation was wheat, and while that crop was not always grown at a profit, settlers were compelled to devote a certain area to that cereal, in order to enable them to kill the mallee shoots and bushes. During the past few years prices received for wheat had been very good, but when the market reached a pre-war level he thought it would be a good plan to sow a proportion of the land with malting barley. Oats were also a crop that had to be grown to assist in the eradication of take-all, and after sufficient had been cut for fodder, there was usually a fair area to be reaped. In some years the prices ruling for oats were below what it actually cost to produce the crop, and if a suitable building on the farm was erected, wherein the oats could be stored in bulk, he believed it would pay farmers to hold them until prices were more favorable. As clearing operations progressed more time could be devoted to side lines, and of those he believed sheep would prove to be one of the most important and profitable undertakings for the farmers in that district. At the present time the Merino was the most popular breed, but when the freezing works were established at Port Lincoln he thought farmers would be well advised to turn their attentions to crossbreds for the export trade. If that was done the natural pasture would have to be supplemented by the planting of fodder crops. He had tried New Zealand rye grass and subterranean clover, and both had given good returns. Pigs were a profitable side line, even if only kept to supply the household with bacon, and with the advent of the bacon factory he thought a payable

industry could be built up. Cows were also necessary for supplying the household with the necessary produce, and if good animals were kept there should be a surplus of butter that could be sold. Turkeys and fowls should not be omitted, the former being fairly easy to rear if the foxes were kept away, and capable of commanding a good price in the Adelaide markets. An interesting discussion followed.

CLEVE, April 21st.—A paper dealing with the subject, "Conveniences for the Housewife," was contributed by Mr. L. E. Cowley, and an interesting discussion ensued.

SMOKY BAY, May 6th.—The meeting was devoted to a lengthy discussion on the local experimental plots.

TALIA, May 8th.—The Hon. Secretary (Mr. J. McBeath) read a paper, "District Roads," which resulted in a long and well-debated discussion by all present, the meeting unanimously agreeing that more attention was necessary to roads in constant use by outside settlers, and that Bureau Branches in neglected districts should support, and in every way assist, in trying to get justice done by the responsible departments in the districts concerned.

## EASTERN DISTRICT

### (EAST OF MOUNT LOFTY RANGES)

#### BLOCK E.

May 9th.—Present: 21 members.

PREPARATION AND CARE OF THE LUCERNE PATCH.—In the course of a paper on this subject, Mr. C. Pitt, sen., said the lucerne patch had of late years been neglected, and in many cases cut out altogether. That, he believed, was due to the high returns that had been received for fruit, but, in his opinion, a lucerne patch was an absolute essential on a fruit block. It was a great standby in hard times. One acre of lucerne would keep three cows going comfortably, thus bringing in a steady income. In selecting the site for a lucerne patch it was a mistake to choose the worst piece of land on the block. The land should be ploughed and graded with a fall of at least 1½ in. to the chain. Water would lie on level ground, and that was fatal to lucerne, especially on hot days. After grading, the land should be deeply ploughed and, if possible, subsoiled. The plot should be given a good dressing of gypsum, and as good tilth was necessary the land should be cultivated and then harrowed. If autumn planting was intended, the work should be carried out not later than March, but if performed during the spring time it should be done in August, preferably after a rain. On no account should the seed be planted and then watered immediately, as that would burst the seed and spoil the germination. The seed should be sown broadcast at the rate of 14 lbs. per acre, which would ensure a thick growth. The seed should not be buried more than ½ in. deep. The best method of burying the seed was to drag a bough over the land. After about six weeks the plot should be lightly worked with the harrows. Stock should not be allowed to graze on the young lucerne. When there was about 6 in. of growth it should be cut with a scythe and allowed to rot on the ground. If the plot only covered an acre or less, it did not pay to buy implements. The lucerne should be cut at first sign of flowering. If left longer the leaves would fall, and much food value would be lost. After the dew had evaporated off the plants, the crop should be immediately carted and stacked, otherwise the lucerne wilted, and would lose nine-tenths of its value in a few hours. There need be no fear of stacking the lucerne in too green a condition. After the first year the land should be disced and fresh seed sown in weak patches. No manure would be necessary for the first year, but during succeeding seasons 2 cwt. of blood manure per acre and a dressing of sand would be found very helpful.

**BORRIKA.**

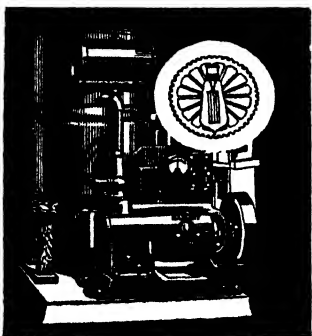
April 18th.—Present: eight members.

**HARVEST OBSERVATIONS.**—Mr. Brown reported that he had sown four bags of Felix wheat on 13 acres of fallow. The seed was sown in June, 51lbs. of grain and 128lbs. of super to the acre, and 76 bags were reaped at harvesting. Mr. Cowled reported sowing three early wheats—Florence, 3 acres; King's Red, 7 acres; and Golden Drop, 2½ acres; each sown on fallow of the same quality. Sowings were as follows:—Florence, 1bush. unpickled; King's Red, 1bush. pickled; Golden Drop, 1bush. pickled; each sown with 93lbs. 45 per cent. super per acre. Florence developed earliest, and yielded 16bush. without any signs of smut. King's Red returned 12bush., and was slightly affected with smut. Twelve bushels was reaped from Golden Drop. Adjoining these plots were 30 acres of Budd's, 13bush. of which were affected by take-all. Nearly all the early wheats were free from take-all.

**BRINKLEY.**

May 6th.—Present: 11 members and five visitors.

**FARM BUILDINGS.**—Mr. E. R. Martin contributed a paper on this subject which was read by the Secretary (Mr. A. W. Richards). The most economical wall to build in that district, he said, was one 12in. in thickness, because the mason could put larger stones in the wall, and thereby save time and mortar. A wall of less thickness would be more difficult to build, and would not be so strong. No stone less than 3in. in thickness should be used on the outside, because it helped to weaken the wall, and there should be a large stone taking up the full width in every square yard of the wall. Bricks would make the best ends and corners, but if good square stones were obtainable they would be suitable for barns and stables. Lime could be burnt cheaply in that district, thereby decreasing the cost of building. He thought the best way to handle lime when mixing mortar was to have half an old 200gall. tank, and slack the lime in it, adding just enough water to make it thin enough to bale out with a bucket into a ring of sand. It should then be well mixed, preferably some time before being required for use. If it was to be used for flushing a wall it should be made a little richer, because it would keep out the water and add strength to the wall. During the discussion which followed, Mr. J. A. E. Schenscher said that the foundations should be at least 4in. wider than the wall on each side. He was in favor of a concrete wall for farm buildings, because it was strong and easily erected. Mr. L. W. Rust favored the use of stone that had been quarried in preference to surface stone, because it did not break and crack so readily. Mr. H. H. Martin thought the foundations should be 6in. wider than the wall.



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## LOXTON (Average annual rainfall, 12in. to 13in.).

April 27th.—Present: seven members.

CARE AND MANAGEMENT OF HORSES.—Mr. R. T. Mayfield read the following paper:—"Although tractors have been tried by some farmers in Australia, only in a very few instances has their use been continued, probably because of the high cost of fuel in this country. Our agriculturists are still, and are likely to remain, in the position of having to depend on horses and carting. Consequently it behoves the agriculturists to pay every attention to his horses, not only from a humanitarian point of view, but also as a matter of business with respect to the amount of income to be derived from the use of these animals. You can always pick out the prosperous and energetic farmer by the look of his team. The man that comes in with his horses looking fit for work is the one who is moving forward, and the one who enters the town with the poor skinny animal with the rough coat is the farmer that is not, and never will be, progressive until he realises that it is his horses that make his living. The mares should not be allowed to get too fat, and always be kept at steady work till about a fortnight from foaling, when they should be turned out on green grass. After foaling, the mare and her foal should be hand-fed until harvest time. They were then brought into the stable. After allowing the foal a few days to become accustomed to the men attending to the horses, he was caught and tied by a strong rope to a wall. Do not tie him to a fence, or the foal will probably get his legs caught in the wires, and be badly injured. After being taught to stand quietly when tied up, the colt should then be taught to lead. This may seem a waste of time, but when the time comes for putting the young animal in the team you will find him very easy to handle, and there will be practically none of the waste time so usual with the breaking in of horses that have reached three or four years of age before they have been handled. A good warm stable is essential in maintaining the horses' health and condition, and saves at least 30 per cent. of the food bill. On many farms much time and money have been spent on the roof of the stable, but little or no attention has been paid to the walls surrounding the building. In my opinion the walls are of more importance than the roof, as horses are affected more by cold wind than they are by rain. Horses should always be fed regularly and watered before, rather than after, their feed. For 10 years my horses have been practically free from sore shoulders, and I hope that the following plan will be the means of explaining to others how a little attention to the collars and shoulders will assist them in keeping their horses free from this trouble. When commencing to work the team after it has been spelling in the paddocks, I do not make them do a full day's work, as this will bring blisters on their shoulders. The first two or three days just work them for an hour or two to allow the shoulders to become tough, and you will find that there will be less trouble than if you put them straight to heavy work. On each of these occasions bathe the shoulders and then gently run your hand over the place where the collar touched, taking careful note of any place that seems tender and causes the horses to flinch. The stuffing in the collar should be eased so that it does not press so heavily on the spot the next time the horse is in harness, and so prevent a sore from appearing.

## MURRAY BRIDGE.

February 21st.—Present: 15 members.

TREATMENT OF CREAM.—In the course of a paper dealing with this subject, Mr. F. T. Edwards advocated about 48 per cent. fat as a standard of consistency for cream. In thick cream the germ life had much less chance of increasing, owing to the fact that it lived on the curd, and could not exist on pure butter fat, hence the more fat the less chance for germ life. When cream was too thin it did not keep well, and did not make such good butter. On the other hand, if the cream was too thick it would not develop such a good flavored butter as a more medium cream. At each separating the cream should be put into a separate vessel; on no account should warm cream be placed with cold cream, as that caused the germ life to grow rapidly. Germs grew at a very rapid rate when the conditions were favorable for them. Stirring was a simple matter, but was very important, as it allowed the gases to escape. The froth on the top of the cream allowed a mould to develop, and that was the first indication of stale cream. Stirring the cream checked the development of the mould. Cream should be delivered to the factory as

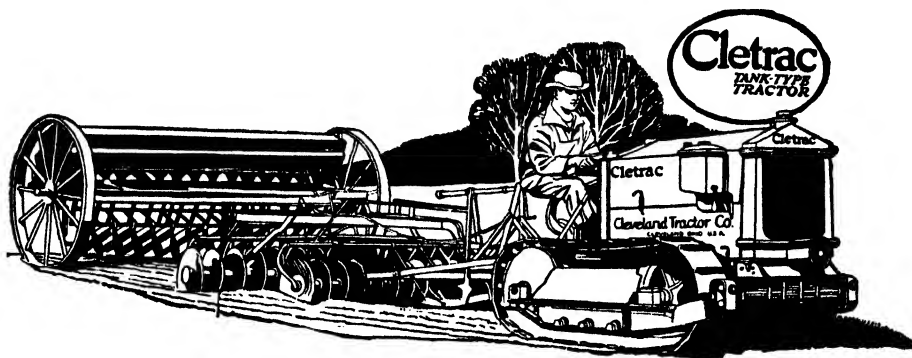


soon as possible. There was no need to wait for acid to form in the cream, for when the acid did form it had to be neutralised. It was not a fact that by holding the cream a better test would result. The cream should be taken from the cellar at night, as most cellars, though cool at day, became very close at night. Cattle depastured on swampy land often gave milk that was tainted to a certain extent, but by properly feeding lucerne the taint might be avoided. When lucerne was allowed to wilt such defects in the milk would be avoided. Fermentation was a natural process, and usually it was the very thin cream that readily fermented, and from which it was impossible to make good butter. Preservatives should be used sparingly, but salt and saltpetre in small quantities could be used with safety. A discussion took place on the paper, and Mr. Edwards answered many questions bearing on the subject of the address. At a further meeting, held on March 21st, Mr. Rankine (Stock Inspector for the district) gave an address, "Tuberculosis in connection with Meat Inspection."

**BARMERA**, May 9th.—Mr. J. C. P. Bruce delivered an interesting address, "Plant Life," and at the conclusion of the lecture replied to numerous questions.

**GERANIUM**, May 9th.—The Instructor for Mallee Lands (Mr. C. P. Hodge) attended the meeting, and delivered an address on the subject, "Take-all." Members were also nominated to attend the Short Court for Farmers at the Roseworthy Agricultural College.

**LAMEROO**, May 6th.—Mr. A. J. A. Koch read a paper, "The Weather," in which he gave an outline of the weather conditions that prevailed during 1921. He also dealt with many of the popular beliefs of people regarding meteorological changes and disturbances. The paper then read as follows:—"On every hand favorable comment is being made of the very favorable opening of the present season; old hands are looking back in an endeavor to liken previous years to it, and but few are remembered. The opportunity is with us, and how are we to take advantage of it? What to



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do and when to do it are our problems now. I would say that, however anxious we are to get our seed in, do not sacrifice thoroughness for speed. Map out a course of action, put it down in your diary, and stick to it, only departing from it when an improvement on your previous thought presents itself. This is not an early district, and the middle of June is not late to finish seeding. Taking for granted that the fallow is in good order, it can now be further improved. In many instances much of it had to be worked dry in November to keep down the rubbish. The soil is now in good working condition, and if a farmer has a large cultivator any land that is to be sown last should be now cultivated. This will check rubbish and make it more easily dealt with than if allowed to grow strong and become matted together. This would spoil tilth, and have a tendency to form a hollow seed bed, in which, without rolling, the germination of seed is a risky matter. If the land that is sown with late wheat is now cultivated, then harrowed, drilled, and harrowed again, it should have had sufficient treatment to ensure the best returns. The first-mentioned land should now be harrowed, then cultivated, drilled, and harrowed again. No man engaged in agricultural pursuits can afford to cease making a very careful study of weather and seasons, and in order to be prepared to take advantage of it, a careful record should be kept from day to day. Just as essential as a Big Ben to wake him in the morning is a barometer to warn the farmer of approaching weather changes. To those who take a daily paper the weather map should be of as much importance as the quotations for produce and livestock in the commercial column. The telegraph and telephone, coupled up as a great Government machine, play their parts in advising us of weather prospects, and now that wireless is playing such an important part in commercial and national activities, I see no reason why, by the aid of ocean-going steamers, we should not be able to forecast weather definitely at least three weeks ahead, making certain allowances for unforeseen circumstances over which we have no control. It only needs a moment of thought for one to grasp the many advantages to be gained by this knowledge, especially to a country whose principal industry is that of primary production, and whose products are gaining in popularity in thickly populated countries, whose people need them so urgently."

MOOROOK, May 9th.—The meeting was devoted to a discussion on the forthcoming pruning competitions of the River Murray Branches of the Agricultural Bureau.

MONARTO SOUTH, May 6th.—Mr. J. Hartman read an article from the *Journal of Agriculture*, "Blowflies and Sheep." Subjects were discussed and experiences were related by members. Some had used kerosine with very little effect; others recommended bluestone. Others had found a compound very good. The general recommendation was to keep the sheep clean in order to minimise the trouble.

PINNAROO, April 12th.—To an audience of 15 members and nine visitors the Government Poultry Expert (Mr. D. F. Laurie) delivered an address, "The Housing, Breeding, and Feeding of Poultry as a Side Line on the Farm."

TAPLAN, April 19th.—The Instructor for Mallee Lands (Mr. C. P. Hodge) attended the meeting, and addressed the members on various subjects of interest to settlers in the mallee.

TAPLAN, May 13th.—A paper on the subject, "Opening Up and Working a Mallee Farm" was read by the Hon. Secretary (Mr. P. R. Hodge), and a short discussion followed.

WILKAWATT, May 6th.—Mr. C. P. Hodge (Instructor for Mallee Lands) attended the meeting, and delivered an address, "Take-all."

WINKIE, May 8th.—Mr. W. Muspratt (Irrigation Instructor) attended the meeting, and read a paper, "Rack and Dip Tank Building." At the conclusion of the paper Mr. Muspratt replied to numerous questions.

YOUNGHUSBAND, May 11th.—Mr. D. Brinkley contributed a paper, "What is it that Pays the Best?" and an interesting discussion followed.

**SOUTH AND HILLS DISTRICT.****ASHBOURNE.**

April 28th.—Present: 20 members and one visitor.

**FENCING.**—In the course of a paper on this subject, Mr. Geo. Sissons said in their district it was customary to space the posts 9ft. or 10ft. apart, but whilst such a structure made the best cattle fence, he thought it would be well worth while in making a new fence to consider spacing the posts further apart, and using a dropper between. As to the best kind of timber to be used for the purpose, they had a fairly large variety to choose from in the Ashbourne district—red, blue, white, pink, or scrub gum and stringy bark—but he expressed preference for either matured blue or pink gum. Red gum was fairly durable if obtained from young trees whose butts would split from four to eight posts, but posts taken from the old trees were susceptible to dry rot, and after they had been up a few years would, if pushed by stock, snap off at the surface of the ground, and in a bush fire they would burn more readily than other timber. Stringy bark made excellent posts if split from matured timber and allowed to dry before being erected, but he considered it a great pity to use it for that purpose, as it was about the only tree they had from which rails could be split, but it had for posts one definite advantage over the others in that unless ant-eaten or very old and rotten, a fire would not make much impression on it. Whatever material was used, he preferred split to either sawn or round timber; the sawn was too liable to break, and the round was too sappy, the outer surface rotted away and left the posts loose and ready fuel for the first fire that came along. Where all kinds of stock were kept, the posts should be cut 5ft. 10in. long, and not less than 6in. x 3in. at the smaller end, putting them 22in. in the ground for a sheep fence. The corner strainers should be 7ft. long and not less than 12in. x 12in. at the smaller end, being let 2ft. 9in. in the ground. The intermediate posts could be

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6ft. 3in. and 6in. x 6in. For a cattle fence four wires, the top plain, the second a barb let through the posts, and the third and fourth plain, would be found satisfactory, but for horses a barb on top would be needed as well if the price was not prohibitive. Three feet 18gauge 1½in. netting added would make a fence that should resist the trespass of all farm animals, including rabbits. For sheep four wires with 2ft. 6in. 19 gauge 3in. netting would be found more effective than the ordinary six wires. The stock yards would, of course, be built to a height to suit the owner's requirements, but if material was available they should be constructed entirely of wood, with posts and rails only, or, as an alternative, rails and uprights if they were to withstand small stock. The lower rails should be fitted "rider" fashion, as breakages would be more easily replaced, but the top rails should be sidelapped into an open mortice on the top of the post, and kept in position with a wire pin. He preferred wooden gates to iron, as a broken wooden gate was more easily repaired than a bent iron one. They should be 6in. higher than the rest of the fence, with the bars close enough to prevent stock from putting their heads through. As the object of fencing was to keep stock from trespassing, every breakage should be attended to at the earliest opportunity, as nothing made rogues of stock more quickly than unkempt fences. A wire fence that was not interfered with by stock should be strained up occasionally, even if the wires were not slack. It would be found that the wires rusted very quickly in the augur holes, and for that same reason it was better to use a ½in. bit in preference to ¾in. for boring, as the increased space would give the wind a better opportunity to keep the holes clear. The meeting then took the form of a social evening, to bid farewell to Mr. Sissons, who was leaving the district.

#### CHERRY GARDENS (Average annual rainfall, 35.03in.).

May 9th.—Present: 12 members.

STRAWBERRY CULTIVATION.—In the course of a paper on this subject, Mr. C. Morgan, a visitor from the Ironbank Branch, said strawberries if grown in a suitable location and well cultivated have been known to produce more fruit for the size of the plant than any other fruit grown, the crop lasting sometimes for four months, or even a longer period. The plants should be cultivated properly from the start, and the land grubbed and ploughed to a depth of 18in., or more if possible. A good plan to adopt was to plough the land to a shallow depth, and leave it in a rough condition, and then work it up to the desired depth the following year, care being taken to mix the soil thoroughly, and not leave too much of the clay subsoil on the surface. Thorough draining was most necessary, for stagnant water or cloggy soil about the roots of the plants tended to attract and develop disease. If the ground was rough the stones could be used for making drains; if not, slabs would have to be used. The drains should be made at least 2ft. deep, and if stones were used, the drains should be filled to within 1ft. or 1½in. of the surface, and rubbish placed on the top of the stones. Planting could be undertaken any time between May and September. If the work was carried out in June plenty of time would be afforded to finish up and start skim-digging the old bushes in July, which should be completed not later than the end of August. Planting when the ground was very wet should be avoided, as that "pugged" the land, and prevented the young plants from making a good start. Planting should be done with a trowel, and care taken to see that the roots were well set out, and not clogged together. If the roots were very sticky they should be washed before planting. Young plants required hoeing about three weeks or a month after planting to allow air and sunshine to penetrate into the soil. Three or four hoeings should be made during the first year, but the summer working should only be performed at a shallow depth. One year old bushes would not need skim-digging if they were given sufficient manure at planting. During the second year 10cwt. to 15cwt. of bonedust to the acre should be dug into the soil to a depth of 4in. or 5in. After skim-digging, the plot should be hoed once or twice before the fruit ripened, when the plants could be cultivated after every heavy rain. Weeds of any kind were detrimental to the plants, one of the worst being sorrel, and if allowed to grow and spread would soon overrun the bushes, and make cultivation too expensive for the average fruitgrower.

**KANGARILLA.**

May 12th.—Present: 17 members and visitors.

**SEEDING.**—Mr. A. Bottrill delivered an address on this subject, and in the discussion that followed, Mr. Biddle considered Marshall's No. 3 the best variety for their district. Mr. Baker expressed the opinion that the quantity of manure used per acre should be determined by the rainfall. Some members considered that a certain amount of manure was washed down by the excessive rains that were received in that district. Mr. Bottrill referred to the quantity of seed and manure to be used in the gullies. Most members favored guano for the Kangarilla district. Mr. V. Biddle favored working the ground well before seeding commenced. Most members thought shallow planting the best. The difference between the hoe and disc drill was discussed, and one member said he noticed that in using a disc drill on the hill side the seed from one side of the drill came up a few days before the other side. One member spoke of mixing wheat and oats for hay, and Mr. Baker said White Tustan wheat and Algerian oats grew well together, and ripened about the same time. For separate crops Mr. Morphett said wheat should be cut on the green side, and oats when ripe.

**RAPID BAY.**

May 6th.—Present: 14 members.

**GRASSES AND FODDERS IN NEW ZEALAND.**—The following paper was read by Mr. E. A. Schmidt:—"Most of you undoubtedly know something of the quantity and quality of the mutton, beef, and dairy produce which New Zealand exports. New Zealanders have long ago realised that, unless they can offer England, which until recently was her greatest purchaser, quantity as well as quality, the reputation they sought, as producers of these articles, would remain an imagination. The

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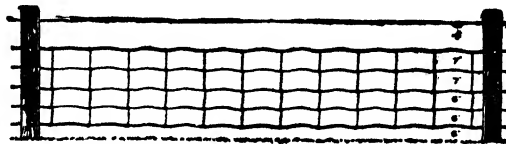


Fig. 7—Cyclone Spring Coil Sheep Fence.

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farmers and stockraisers were taught to realise that they would have a greater credit balance in their banking accounts if they could double their output of sheep and cattle. They got to work earnestly, and procured the best experts available, often at great cost. These experts treated the matter scientifically, made experiments, noted the results, compared them with results and scientific records of other countries, educated the men on the land, especially the rising generation, with most amazing results. The output of beef and mutton was not only doubled, but the results were above all expectations, and New Zealand soon became world-renowned for the quality of its mutton, beef, and dairy produce. Besides, the landholder found that his land had more than doubled its value. Further, it was no more difficult for a beginner to get a start than formerly, as he could do so on less than half the amount of land, and he was sure of a good and ready market for his fat stock. Another beneficial result was that it attracted more people on to the land. Slaughtering establishments, bacon-curing factories, and co-operative cheese and butter factories sprang up all over the country, as well as boiling-down and freezing establishments, and works to turn all refuse into fertilisers. Railways offered special facilities for transporting frozen carcasses. Another benefit from this closer settlement and intense culture was centralisation, and in the building up and maintaining of the new industries formed, thousands of extra laborers found a living. But what is it that made New Zealand such a rich country? The answer is, first, the working of the soil, and, secondly, the use of fertilisers. I am not prepared to say that the working of the soil is more thorough than on the best farms in the lower north of South Australia, but I do say that a much better use of fertilisers is made than in South Australia. Among the chief manures used are superphosphate, rock phosphate, basic slag, blood manure, guano, stable manure, in fact, animal manure of all kinds, agricultural lime, and nitrate of soda. Although lime is one of the last mentioned, I believe it is used as much if not more than any other kind of manure. Much of the soil, especially the rich soil, is sour, and grows sorrel and soursobs. There is nothing like lime for sweetening sour soil, and, besides, it is one of the cheapest fertilisers—cheap, because there is such a heavy demand for it that large plants have been erected for burning agricultural lime. Stable and animal manure of every kind is highly treasured. Buildings are erected for storing it, so that it can rot without any of the fertility being lost. Nitrate of soda and phosphates are largely used for top dressings, of which a great deal is done on grass lands. I have had the opportunity of seeing how the bulk of the arable land, most of which, in the North Island at least, is used for grazing purposes, is treated. I will explain how I saw a 40-acre paddock treated. When I passed it the first time it resembled some of the best worked Roseworthy fallow. It was so worked that there was not a weed to be seen in the whole paddock. This land, before it was fallowed, had been pasture land for three years. When I first saw the paddock in January a man was drilling lime into it. Early in March it was sown with rape. By the beginning of May the rape was at its best, and sheep and cattle were put into it. By the beginning of June the rape was eaten out; the soil was well worked again, and immediately sown with swedes or field turnips. These were at their best by the middle of September (at least for stock purposes), when sheep were turned into them. They were so high that the sheep at first could hardly be seen in them. In about three weeks all the tops were eaten off. The sheep next tackled the turnips, which were about 5 in. in diameter and half in and half above the ground. The last week of October a cultivator was run over the ground, and the rest of the turnips were rooted out. The field then resembled a South Australian limestone paddock, but the rest of the turnips provided feed for the sheep for another fortnight. Then the soil was ploughed again, and worked off and on until the end of March. At the beginning of December more lime was drilled into the soil. At the end of March, grass seed and well-rotted sifted stable manure was drilled in. That grass would last three years, and would be top-dressed during the second and third years. After three years the land would be fallowed again, treated in a similar manner to that I have described, and sown with a different kind of grass. It is thought advisable to treat the land thus every three years, and to sow a different kind of grass seed each time, as one kind of grass will take certain elements out of the soil which another will not. Also the temporary rotation crops during the fallowing season are varied

as much as possible. The soil is thus well fallowed, all undesirable grasses and weeds are killed, several fodder crops are grown, much to the advantage of the soil; and if you were to see the land during the second season after it has been sown, you would never think that it had ever been broken up. Various grasses, including English and Italian rye grasses and Prairie grasses, are sown. Harvesting grass seed is quite an industry in New Zealand. The grass is cut with a common sickle. In one instance I saw a specially constructed grass seed stripper in use, which was the only stripper I saw in New Zealand, grain harvesting being chiefly done with the binder and thresher. Laborers look forward to the grass seed harvesting season, for a man who is used to the work, and who is used to handling the sickle, can earn good wages. The work is done at so much per bag of seed. Clover growing and cutting it for hay is carried on on a large scale. I saw clover hay cut in the middle of December. By frequent manuring, and cutting it at the right time, a number of crops can be cut in a year. Most of the land that is too hilly, or otherwise unfit for breaking up, is frequently manured, and the results of this manuring or top dressing of pasture lands must be seen to be believed. If you see the super spreader at work in early spring, and if you came past the place again in a fortnight's time, you would hardly believe it was the same field, and the most remarkable thing is that the paddock can be much more heavily stocked, and yet the feed does not appear to get less. This extra driving force in the soil lasts while the grass is green, and the quality of the grass is improved by manuring. A common way to store feed, especially for dairy cattle, is by means of the silo. The silo is in use on practically every farm. One advantage of it is that practically any green stuff can thus be preserved for the cattle, although clover is preferred if it is obtainable. Much of the land is, of course, rich, and I saw pasture land change hands at £40 per acre. One hundred acres is considered a fair amount of land for a farm, a mixed farm, or dairy farm, and 600 acres is considered to be a station. Much of the land is, however, of

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a poorer nature, consisting of about 6in. of sandy top soil, and with clay as a subsoil, similar to the land around Cummins and Edillilie, on Southern Eyre Peninsula; but instead of having yacca growing on it it is overgrown with fern. These ferns are hard to kill, but once the land is cleared, and has been used for cereal crops for about five years in order to ensure constant cultivation and manuring, it is then sown with grass seeds, and becomes good pasture land. Some of the poorer sandy surface soil and clay subsoil land is greatly improved by sub-soiling, whether it be for cereal and fodder growing or for grass seeding. Lucerne is, of course, grown, but that which I saw did not come up to the standard of that in South Australia. Clover largely takes the place of lucerne. A large amount of rock phosphate made in South Australia is imported into New Zealand annually. I have often wondered why South Australian pasture lands, and especially such as those in this district, are not manured. I know, of course, that the rainfall is lighter than in New Zealand, but I have seen some of the finest pasture lands in New Zealand which were heavily manured in a district where the rainfall was little more than in our district. I have also wondered if it would not pay to sow our lands with grass seeds. I am aware that there are difficulties in the way of adopting such a course, and that the two greatest are, perhaps, that the grass sown would not last for several seasons on account of the absence of summer rains to keep the roots alive, and on account of the stinkwort taking possession of soil that has been cultivated.

#### ROCKWOOD.

May 8th.--Present: 13 members.

LAMBS FOR THE EXPORT MARKET.—The Chairman (Mr. J. J. Bradford) read the following paper:—"This important industry, which intimately concerns the farmer who keeps a flock of sheep, does not receive the attention and care which it deserves. The London market asks for a uniform carcase of high quality meat of good flavor, color, and condition, and it is not for the grower to dictate to the consumer in the old country what he shall buy, but to supply the article most desired by the consumer abroad. Having ascertained the product most desired by the consumer, you choose a breed or breeds which will best adapt itself to the locality as well as possessing the qualities most desired by the market. Attractiveness is a big factor in maintaining an overseas market for export lambs. Whatever you breed, always use a pure-bred sire. The purer the breeding of the sire the more will he transmit his good qualities to his progeny, for if you secure a sire with strong individuality, and possessed of a sound pedigree, good results will be assured. Never purchase a ram in low condition, particularly a two-tooth. It should be in first-class order, for the more readily the sire is to fatten, the more will his lambs follow him in that direction. Choose an active animal, with a bold, upright carriage and plenty of masculinity. Then look for constitution. See that his heart, lungs, &c., have plenty of room to work, and the more air he can get back into his lungs through a big open nostril the better. Pass by an animal with small contracted nostrils. Look to it that his head, though typical to his breed, is not too large, as lambs by a big-headed sire are too great a tax on the ewe when lambing. Select the animal that has a neat head on a short thick neck, well-laid shoulders, and well-covered withers. The tops of the shoulder blades should not protrude above the line of his back, and he should have a prominent brisket. Notice that his top and bottom lines are straight, having well-sprung ribs, giving his internal organs plenty of room. His legs should be set squarely on the body, resembling a box with a leg on each corner. The back should be straight and broad, and the backbone well covered with good solid flesh, not hard, but rubbery to the touch. Keep well away from razor-backed animals. The loin should be heavy, and the rump straight, terminating with a broad dock. A deep flank, with depth and breadth across the britch, will ensure a thick, heavy leg, carrying good flesh right to the hocks. The skin should be soft and mellow, and of a bright pink color. The skin is an index to the quality of the flesh. The best sires for export lambs will be found amongst the Down breeds or black-nosed sheep. The quality of meat of these breeds is very high, and they mature quickly. I would like to illustrate the difference between a well-bred sire and a mongrel. Put it this way: each ram during his working life should get at least 200 lambs. Give each ram the same number and class of ewes kept under similar conditions, and marketed at the same



time. The progeny of the well-bred sheep will easily realise 2s. 6d. per head more than those by the mongrel, consequently the well-bred sheep is worth £25 more to the breeder than the other animal. Everyone that breeds sheep is not a flock master, therefore it is to the benefit of the farmer who breeds export lambs to support the man who is breeding a good class of sires, and encourage him to improve his flock, for it is the farmer who will derive the most benefit therefrom. But it appears to be the custom in this country to encourage the breeder of mongrels. I have repeatedly seen men go to considerable trouble to secure a good line of ewes, and then purchase a ram which looked like a first cousin to a billygoat to mate with them. Having chosen the breed, stick to it; do not be led away by every fresh fancy and breed that comes along. This crossing and recrossing by ignorant people has been the ruination of our flocks. The half-bred Lincoln-Merino or English Leicester-Merino cross ewe is decidedly the best mother for the purpose. The half-bred ewes make much better mothers than the pure Merino. They are heavier milkers, are more jealous of their offspring, and their lambs will mature a month earlier than those from the Merino ewe. The lamb from a half-bred ewe by a Down sire kills much better, the flesh is thicker and of a better color, and the appearance of the carcass much more attractive, while in normal years the difference in value of the Merino ewe's fleece and that of the half-bred is very little." The paper concluded with a reference to the general breeding of livestock. In the discussion that followed, Mr. E. R. Heath said the Down breed of lambs matured more quickly than the Merino. Mr. S. Collett was of the opinion that the Shropshire ram crossed with a Comeback ewe produced the best export lamb. Mr. H. Dunn did not think their district was altogether suited for the production of marketable lambs. He preferred to keep Merinos and grow wool.

BALHANNAH, May 5th.—Mr. H. Bohme gave a practical demonstration with a Babcock tester, testing two samples of milk and one of cream. It was decided that the annual meeting and social of the Branch should be held on Friday, July 7th.

BLACKHEATH, April 7th.—A member read an extract dealing with manures from the *Journal of Agriculture*, and an interesting discussion followed. The subject, "Manures for Fruit Trees," was also discussed. Several other matters of local interest were also brought before the meeting.

MEADOWS, April 5th.—The Assistant Dairy Expert (Mr. H. J. Apps) visited the Branch and delivered an address, "The Dairying Industry." Mr. S. B. Opie (Field Officer of the Department) was also present, and gave an address, "Tobacco Culture."

A further meeting was held on May 10th, when several items of local importance were brought forward for consideration.

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## SOUTH-EAST DISTRICT.

NARACORTE (Average annual rainfall, 22.60in.).

April 8th.—Present: 16 members.

BEAUTIFYING THE HOMESTEAD.—Mr. A. B. Feuerheerd read the following:— "Wherever circumstances and conditions will permit the home should be made beautiful. In speaking of the home beautiful, my remarks will refer chiefly to homes in the country, and it is even more necessary for us to consider the comfort and beauty of our homes in the country than those in and around the city, for those residing close to the city have many advantages and privileges which we do not enjoy, but, on the other hand, we have better facilities, more material, and also more time to devote to the improvement of our homes than the average city business man, who, incidentally, has to put his hand in his pocket for almost everything he requires. How handy it is to be able to go out in the scrub and cut your own material for a bush house, rustic arch, or porch, and again to be able to go to the nearest quarry and obtain the gravel for your paths, yards, &c. These

materials cost us only our own labor; our water supply costs also the same. A capital verandah can be made on the north side of a house (I say the north side, for that is the side most exposed to the sun's rays) from the ti-tree, which is plentiful in this district. One constructed of this material is very cool, it also is durable and effective. If the sides are also enclosed it serves the purpose of a bush house as well as a verandah, and a few quick-growing creepers will soon hide any roughness in construction, and will then give the members of the household a great deal of comfort during the hot summer days. Whenever we can add to our comfort in and about the home we should do so. Labor-saving devices are constantly being thought of in the field, but not so in the home. How simple it is to connect a pipe from the tank to your kitchen and laundry. The cost is little, but the saving is great to those whose work is never done. Then again, it is quite a common sight in the country to see a wife, or perhaps a daughter, going to the wood heap for an armful of wood. They may even have to wield the axe. A large parking case handy to the kitchen would obviate all that, and the wood kept dry and always at hand would indeed be a boon. The red and black soils soon become quagmires in the winter, and for that reason all paths leading in and about the garden, house, sheds, stables, yards, &c., should be well coated with gravel. It makes excellent paths, and at the same time makes it possible to walk about the home during the winter months in ordinary footwear. Nature has provided us so liberally with plant life to suit all conditions of climate, situation, and soil, that there is no excuse for anyone saying, 'I cannot get anything to grow at my place.' All that is lacking in those cases is probably a little knowledge in plant life and also more inclination. Windbreaks, shade, and shelter trees should first be established around the home, but care must be exercised that they are not planted too close to the house or garden. Keep them well back at least two chains from the taller growing trees, and, say, a chain for the windbreaks, hedges, etc. These windbreaks are very necessary about the home, and will greatly assist you in the fruit, flower, and vegetable gardens. And we must not lose sight of the fact that shade and shelter is just as necessary for our livestock as it is for ourselves, and for that reason tree and hedge planting should be carried out about the stables, yards, and paddocks. This month, I consider the most favorable time of the year for general planting. The ground is still warm, and if the young trees, plants, &c., are carefully planted they will become well established before the summer sets in. Plant anything that suits your conditions excepting the African boxthorn. It is a great pity to see this vicious plant established throughout the country when so large a variety of useful plants were available. This is an instance of lack of knowledge and forethought by the person responsible for its introduction to Australia. The African boxthorn is perhaps the only plant that I would advise not to plant, excepting the prickly acacia, sometimes called kangaroo hedge. Of the two plants, I much prefer the latter. After the windbreaks and shade trees are planted the next step should be in laying out the orchard or fruit garden, for every home should have its own fruit supply. Care should be taken in selecting the trees, for it is just as easy to grow the best varieties as the inferior sorts, and make a point of securing early, mid-season, and late varieties, so that you may have a succession, but in selecting vines confine yourself to the early varieties, as the later ones do not mature and ripen so well in the South-East as they do in the warmer districts. The vegetable garden should be your next care. This could be established between the fruit trees for some years, and the extra tilling, manuring, and cultivation required in producing these crops would materially benefit the young fruit trees. Every home should provide its own supply of vegetables, and with a little care and judicious planting the home can be supplied with vegetables the whole year round. Lastly we come to the ornamental department of planting, *i.e.*, flowers, shrubs, &c. Some, perhaps, would say, 'There is no money in them, so what use is there to plant them?' If our minds were all so sordid and everything was ruled by the measure of pounds, shillings, and pence, I could picture the life and the world we would be existing in. It certainly is a rest and recreation to potter about a garden and give your thoughts to it alone while you are there. But, of course, in the home garden the work must not be too arduous, for if that be so it would not be restful, and for that reason the garden plot should only be large enough to give you that rest and recreation. A small plot can easily be attended to, and you will have

something growing which would be worth looking at, but if it be too large it will probably develop into a wilderness, and perhaps rob you of your enthusiasm. I have not dealt at all in the varieties of plants, shrubs, trees, &c., most suitable to plant; these can be looked up and found in any seedsman's catalogue. The object of this paper has been to try and stimulate interest in planting, and instil it in the minds of the young. Give them small plots about the home, and let them plant anything, and they will soon learn what to plant and what not to plant. Keep in mind the words of that dear old song, 'Home, Sweet Home,' and try to make your own home suit those words, and that can be done to a great extent by planting the beautiful things that Nature has so lavishly placed at our disposal." Mr. J. M. Wray congratulated the writer on the forcible manner in which he pleaded for beautifying the home from a social and scenic standpoint, and he was sure everyone present was impressed with the necessity of carrying the views expressed into practice. Mr. W. E. Rogers liked trees about the house, but he found them a harbor for birds, and they took all the fruit in his garden. The Chairman (Mr. F. Holmes) said that the social and moral aspect of the paper struck him very much in connection with attracting children to their home. It was very necessary that the family should prefer their homes instead of the streets.



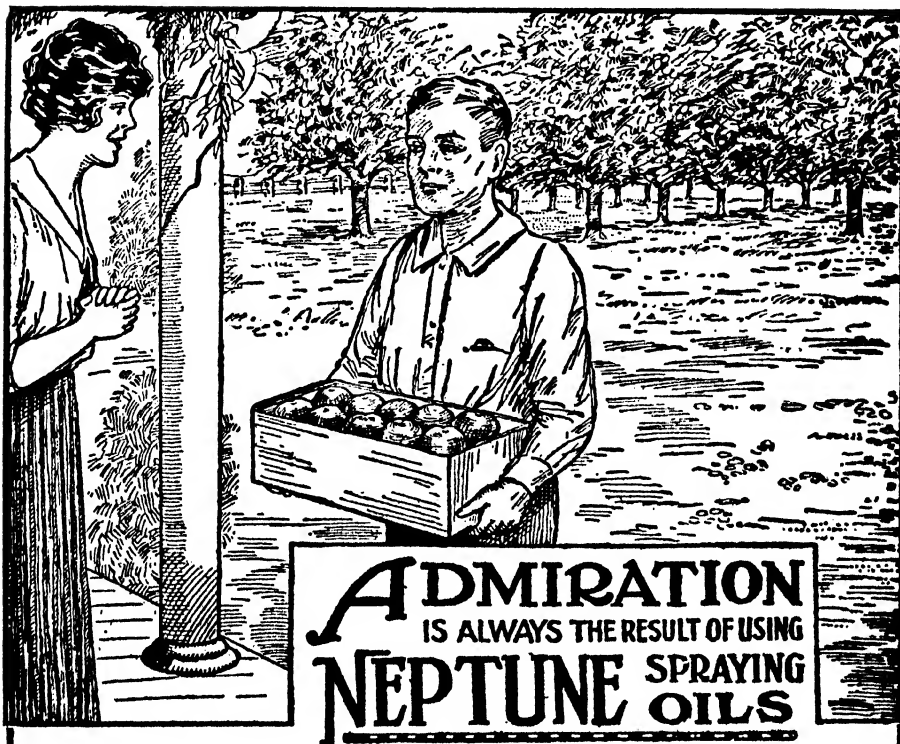
Some of the Delegates who Attended the Conference of South-Eastern Branches of the Agricultural Bureau at Mount Gambier.

KALANGADOO, April 22nd.—Several matters, including the 1922 Conference of South-Eastern Branches of the Agricultural Bureau, were brought forward and discussed.

KYBYBOLITE, May 11th.—Mr. A. R. Rowe gave a demonstration of milk testing with the Babcock tester, and a report of the recent Conference of South-Eastern Branches was tendered by the Manager of the Kybybolite Experimental Farm (Mr. L. J. Cook).

PENOLA, May 6th.—Messrs. Hinze, Clifford, and Adamson, who represented the Branch at the Conference of South-Eastern Branches recently held at Mount Gambier, gave a report of the proceedings of the gathering. Other matters of local interest were also brought forward for consideration.

WIRREGA, April 8th.—Mr. Exton read a paper from the *Journal of Agriculture*, and an interesting discussion followed. Other matters of local interest were also brought before the meeting.



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# THE JOURNAL

OF THE

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### OF SOUTH AUSTRALIA.

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**All communications to be addressed:**

**"The Editor, Journal of Agriculture, Victoria Square, Adelaide."**

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T. PASCOE,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### Official Herd Testing.

In addition to the provision of subsidies to encourage the formation of local herd-testing associations, under regulations approved by the Honorable the Minister of Agriculture (Hon. T. Pascoe, M.L.C.), in 1920, the Department of Agriculture undertakes to conduct official tests of stud herds. The owner of any herd of pure-bred dairy cattle may submit his herd for test. Animals which during the official lactation period (*i.e.*, nine months) produce butter in quantity equal to or above the standard are awarded the Government certificate. The standard fixed is:—Heifers, first calf, 175lbs. butter fat; cows, three years and under four years of age, second calf, 200lbs. butter fat; cows over four years, third calf or over, 250lbs. butter fat. Herds which are at present under official test are those of Messrs. F. Coleman (Saddleworth), L. T. Cowan (Blakiston), F. H. Butterfield (Fulham), W. B. Neumann (Hampden), J. A. J. Pfitzner (Hampden), W. J. Eckermann (Eudunda), A. J. A. Koch (Lameroo), W. Hawker (Anama), H. Lawton (Hilton), H. H. Shillabeer (Kilkenny), C. A. Dawkins (Gawler River), L. A. Fawcett (Kapunda). In addition, the department is conducting semi-official tests on behalf of the following owners:—Messrs. W. A. Steer (Kensington), E. J. Keele (Lockleys), W. Butler (Edwardstown), W. Tregilgas (Willunga).

### Raw Rock Phosphate.

Raw rock phosphate, which is found in considerable quantities in South Australia, is being tested as a manurial dressing on wheat, pease, and pasture land by the Department of Agriculture at the Kybybolite Experimental Farm. Large areas of country in the South-East particularly are naturally deficient in lime, a condition which provides a hindrance to the effective use of superphosphate as phosphatic dressing, on account of the acid nature of the fertilizer. This objection does not apply to raw rock phosphate, which, in a finely ground condition, should prove of value as a means of applying phosphates in those parts that are subject to reasonably heavy rainfall. It is with the object of securing definite data on these points that raw rocks containing (a) calcium phosphate, and (b) aluminium phosphate is being applied to the soil at Kybybolite. Although the tests have not been under observation for a sufficient length of time to enable definite conclusions to be drawn, it is interesting to note that the results to date show that a dressing of 1cwt. of aluminium phosphate gives a slightly better return than a similar dressing of calcium phosphate, both in the case of wheat, pease, and pasture. This is particularly pleasing because of the existence of large deposits of aluminium phosphate in South Australia.

**New Wheats Do Well at Minnipa.**

Farmers generally are beginning to appreciate the important service which wheatbreeders are rendering wheatgrowers by producing varieties more resistant to disease, more suitable to the peculiarities of soil and climate of individual districts, and of higher yielding capacity. Of the 19 varieties of wheat grown each year since 1918 at the Government Experimental Farm at Minnipa, on Eyre Peninsula, six are three-quarter-bred King's wheat, bred and selected at the Roseworthy Agricultural College. These wheats, viz., Felix, Sultan, President, Emperor, Mahrajah, and Rajah, occupied first, second, third, fourth, fifth, and seventh positions respectively in the table of average yields for the farm for five years. Sixth position on the list is occupied by the widely known and grown Gluyas. In addition to being good grain-producing wheats under suitable conditions, these three-quarter-bred King's varieties are excellent hay wheats. They retain the more desirable qualities of King's, but the beard, to which many farmers take exception, has been bred out of them. They should ultimately prove very popular in the relatively light rainfall districts of the State.

**Horticultural Instructors.**

The Horticultural Branch of the Department of Agriculture has resident Instructors and Inspectors in each of the four principal fruit-growing centres, viz., South-East, Mount Lofty Ranges, north and south, and north of Adelaide. The duties of these officers include inspectorial work under the various Acts of Parliament administered by the Branch, but, in addition, their services are available to advise and help growers in their respective districts. Not only do they make orchard-to-orchard visits, but by giving lectures and demonstrations before Branches of the Agricultural Bureau, and other such organizations, they are able to reach growers in the mass. Just at the present time, the chief concern of fruitgrowers generally is pruning, and quite a number of practical demonstrations on the art of pruning are being given in the fruitgrowing districts by the Instructors.

**Bud Selection.**

The prospective propagator of citrus trees should, at this time of the year, take the opportunity of selecting the trees from which he intends taking buds. Before marketing commences, and whilst most of the fruit is still hanging, the grower can, by inspecting the trees, note the bearing habits, such desirable characteristics as heavy cropping and good quality fruit, of each. At the Government Experimental Orchard at Berri during the past three years a careful record of the bearing habits of each of the Washington Navel orange trees has been kept, and this record reveals that there is a great variation in the number and quality of fruits produced by individual trees. It is only from the most suitable sorts that buds should be taken.

**A Troublesome Orchard Pest.**

American woolly aphid is now one of the most troublesome orchard pests found in the apple growing districts of South Australia. During the past summer, for some reason not clearly understood, the pest has made very considerable headway, whereas formerly it was noticeable only to a limited extent. Of the various lines of treatment recommended for the suppression of the aphid, spraying with some of the standard spray oils exercises a considerable checking effect. Growers are advised by the Horticultural Branch of the Department of Agriculture that they will do well when applying these sprays to utilise single nozzles on their spray pumps, and to apply the spray with all the pressure available. Nothing less than a pressure of 150lbs. to the square inch seems to be sufficient to break down the protecting filaments which envelop the insect. The application of the spray through a coarse nozzle will be found to yield excellent results if it is delivered close up to the mass of insects on the affected parts of the tree.

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**Housing Poultry.**

The prospective breeder of poultry on a commercial scale would do well, before commencing to erect his plant, to consult the Poultry Branch of the Department of Agriculture. Housing constructed to give the maximum accommodation, and at the same time reduce labor to a minimum, is most desirable. The big modern gable-roofed laying house designed by the department is proving most successful. Plans of this as well as of the corridor breeding house are available on application. This type of breeding house is labor saving, convenient, and enables one to control the important operations connected with mating and breeding. Plans of the old-style breeding house—continuous system—can also be had. The breeder should not overlook the importance of laying out the whole plant properly at the commencement of building, even when it is intended to enlarge from year to year. Every building erected should form part of a future enlarged permanent plant.

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**Hatching.**

The breeding season for poultry has already begun. Heavy breeds, such as Orpingtons, Plymouth Rocks, Langshans, Rhode Island Reds, Wyandottes, Sussex, &c., should, for commercial purposes, be hatched during July and August. The light breeds, Leghorns, Minorcas, Anconas, Andalusians, &c., should be hatched during August and September—the bulk during the latter month. Late hatched chickens are of no value on commercial poultry plants. Brooding accommodation should be ample. Overcrowding leads to great loss. A brooder which will accommodate 50 chickens until they are a week old will hold but 40 the second week, and 30 the third week and afterwards. From the warm brooder they should go into cool brooders, when about a month old. The "Poultry Manual" issued by the Poultry Branch of the Department of Agriculture gives full instructions as to methods of incubation and brooding. Plans of a hot air brooder can be obtained free on application to the department.



**Veitch Visited.**

The Director of Agriculture (Professor Arthur J. Perkins), who has just returned from a visit to the Government Experimental Farm at Veitch, stated on Monday that the crops were finer for the time of the year than he had ever seen them before for that district. If anything, they looked over rank. The experimental plots, barley and wheat on new land, were exceptionally clean, and well laid out, and making very good growth. Likewise, the olives were making very satisfactory growth, particularly in the lighter type of land. It was proposed, the Director remarked, to extend the area under olives from year to year.

**Bulls for Hire.**

For some time the Department of Agriculture has made a practice of leasing to private individuals, Branches of the Agricultural Bureau, and other similar bodies, well-bred dairy bulls. Of the stock which the department has for this purpose there are two milking shorthorn animals now available. Should these animals not be applied for in the near future, the department proposes to dispose of them by sale; therefore, dairymen who are desirous of securing the services of a bull for a term of six or 12 months should make early application to the department.

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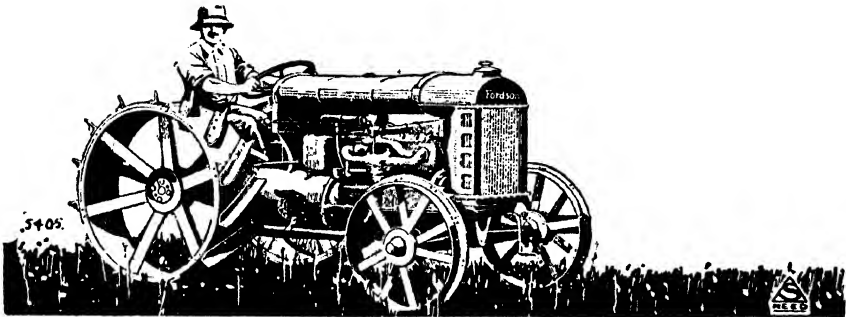
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## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Replies supplied by C. A. LOXTON, B.V.Sc., Government Veterinary Surgeon.]

"E. C.," Penong, reports discharge of blood from teats of cow, following calving.

Reply—This is probably due to congestion of the udder. See reply to "Salisbury" in *Journal* for March, page 679. Milk her carefully. Give her 1lb. Epsom salts, 1 cupful of treacle in a quart of warm water. The milk is not fit for use while it shows the presence of blood.

"W. H.," Minnipa, reports death of pig. *Post-mortem* showed worms in the liver.

Reply—The worm is the common round worm of the pig (*Ascaris suum*), which occasionally finds its way up the bile duct to the liver. It is most common in pigs under four months old. Treatment: Give turpentine at the rate of one teaspoonful per 100lbs. live weight. It is most conveniently given in a little milk, in which case the pigs will take it in the feed. If you are dosing many you should divide them up into lots of three or four, so that each one will receive a proper dose. Give first thing in the morning, after at least 12 hours' fasting. Give the turpentine for three consecutive mornings.

"M. J. G.," Block E, reports aged horse with swelling of the hind legs.

Reply—Give the following powders:—Powdered sulphate of iron, ½oz.; powdered nux vomica, ½oz.; powdered gentian, 1½ozs.; bicarbonate of soda, 2ozs. (mixed). Give one twice daily in the feed. Feed him generously, and if there is any sign of faulty mastication, have his teeth examined. Follow these powders with Fowler's solution of arsenic, one tablespoonful twice daily in the feed for a fortnight.

"D. H. W.," Mount Barker, reports number of sheep with swelling under the jaws, which in several cases resulted fatally.

Reply—This swelling is due to debility. It is a common symptom in parasitic anaemia. If you have any further losses, examine the fourth stomach for worms. Some of these forms are very minute, and a close examination is necessary. Wash off the food material, and examine the lining membrane for short, hair-like worms. Put sheep on good pasture, provide a lick of salt, bonemeal, and sulphate of iron in the proportion of 20-20-1. A 1 per cent. solution of sulphate of copper (bluestone) makes a good worm drench. Dissolve ½lb. bluestone in 1 quart of boiling water. Dilute this with sufficient cold water to make 3galls. The dose is 3ozs. for sheep and half this quantity for lambs. This solution should not be mixed in metal vessels.

"H. A. M.," North Bore, Lameroo, reports mare with a soft, painless swelling, about the size of an emu's eggs, above the point of the shoulder.

Reply—The swelling is probably due to some form of injury, such as bruising. If there is an absence of heat or pain, and the swelling apparently contains fluid, you had better evacuate it. The contents may be pus or a clean, straw-colored fluid. Clip the hair off the part you intend to lance. Use a clean, sharp knife, which should be boiled for five minutes before using. Make the incision about 1½in. long in such a manner to effectually drain the swelling. Dress with a solution of permanganate of potash (Condy's) in water.

"E. C. F.," Lyndoch, has aged gelding affected with chronic scouring.

Reply—Diarrhœa is a symptom of some intestinal irritation. You should examine his droppings for sand or worms. If his feed is not well masticated, have his teeth examined. Feed him carefully and water before feeding. See that his feed is of good quality. Keep him warm by rugging. Give him the following powders in his feed:—Pulv. ferri sulph., 1½ozs.; pulv. gentian, 6ozs.; pulv. anisi., 2ozs.; mix. Divide into 12 powders; give one twice daily in his feed.

"H. K.," Renmark, has horse in good condition, shows no signs of illness, but is very sluggish in all its movements.

Reply—The symptoms may be due to sand, though they are characteristic of nothing in particular. Give him the following powders:—Powdered nux vomica, ½oz.; soda bicarb., 3ozs.; powdered gentian, 3ozs.; mix. Divide into 12 powders. Give one twice daily in the feed. Examine his droppings for sand, and if you detect any, give him sufficient mash and soft food to keep his bowels relaxed.

"A. H.," Sedan, reports cow off feed, and moves slowly, groaning at every step. Milk flow has stopped.

Reply—Give her the following powder:—Powdered nux vomica, ½oz.; powdered ammon. carb., 1½ozs.; powdered gentian, 3ozs.; mix. Divide into six powders. Give one twice daily in a little water with a cupful of treacle. Give her soft food, and as soon as the powders are finished, give her 1oz. each of salt and bone-meal twice a day in bran and chaff.

Hon. Secretary, Agricultural Bureau, Tarlee, asks if barley straw used as bedding for horses tends to breed lice?

Reply—Barley straw does not breed lice, but it may harbor certain mites which would temporarily cause a good deal of irritation about the legs, head, or belly of horses. They would only live for a few days, and may be destroyed with a solution of sheep dip (non-poisonous) or Cooper's milk oil fluid.

"M. A. H.," Cleve, reports aged mare lame in the off foreleg and hollow on the shoulder blade.

Reply—You can try an application of red blister made by mixing 1 dram of red iodide of mercury to 1oz. of lard. Clip the hair off before applying. Rub in for five minutes. Tie her head up short for an hour after blistering. There is a possibility that the lameness is not referable to the shoulder, the wasting of the muscles being due to disuse of the limb.

"A. H. J.," Gawler, has aged cow due to calve in June. Unable to rise, eats fairly well, chews cud, but is in poor condition.

Reply—The cow has a form of partial paralysis, and if she is old, out of condition, has been down some days, and has probably been injured by the fall down the bank, she will not respond to treatment. The heavy breathing, etc., on being turned over suggests fracture of the ribs. If you desire to treat her, she should be made comfortable. Provide her with a good bed of straw. Keep her propped up on her brisket. Rug her when the weather is cold. Give her the following powders:—Strychnine sulphate, 6 grains; white sugar, 2 drams; mix. Divide into 24 powders. Give one powder four times a day by placing on the tongue. Also, the heifer calf, tucked up appearance; stiff in hindquarters. Give her the following powders:—Powdered nux vomica, 2 drams; powdered carbonate of ammonia, 6 drams; mix. Divide into six powders. Give one powder twice a day with a tablespoonful of treacle and a pint of water.

"A. R. J.," Wudinna, has cow due to calve in a fortnight, when dried off, blood and matter discharged from back quarter.

Reply—It is not advisable to use the milk unless it is quite normal again. She appears to have a chronic mammitis, and you are likely to have trouble with it again when she calves. If two quarters are affected it would be as well to fatten her for the butcher. You will, however, be able to let her rear the calf.

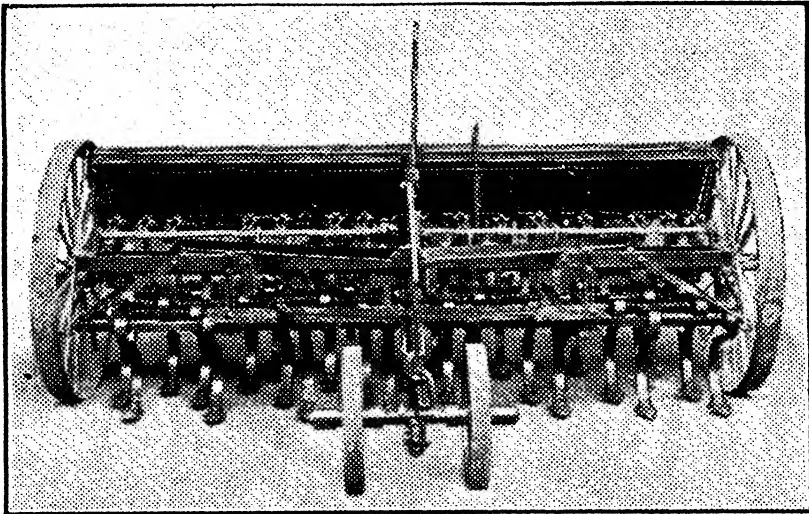
"S. J. P.," Muloowurtie, has aged gelding, continually lying down. Walks about with nose close to the ground.

Reply—Give him a dose of laxative medicine (raw linseed oil, 1 pint), and put him on soft food, mashies, &c., for a few days. If his bowels do not respond to the medicine, give him enemas of warm soapy water. Bluestone is usually recommended for treating stock water. Use 1½ozs. per 1,000galls.

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**OR COUNTRY AGENTS.**

"E. M. S.," Port Lincoln, asks are freshly burnt yaccas poisonous to cattle?

Reply—This bush has been at times responsible for considerable loss in cattle. It possesses a chemical as well as a mechanical effect. The principal symptoms noted in cattle is that of dribbling of urine and weakness in hindquarters, staring coat, and, if left long enough, death itself. Speedy recovery, however, is made if removed on to other pasture. The mechanical effect is generally that of impaction and digestive disturbance. Caution should be exercised, and cattle should be removed as soon as any symptoms are shown.

"E. F. C.," Ki Ki, has 7-year-old gelding suffering from loss of appetite and stiffness in the hindquarters.

Reply—I advise you to give the following medicine:—Tincture of nux vomica, 1 tablespoonful; bicarbonate of soda, 1 tablespoonful, in a pint of water twice a day. You should be able to obtain the nux vomica at the local store. In this case do not regard the directions on the bottle regarding dosage.

"K. McL.," Moorak, reports saddle horse with swelling of the stifle, accompanied by lameness.

Reply—The case is one of chronic inflammation of the stifle joint, which frequently causes permanent lameness. The treatment is a long rest after blistering. As this horse has been lame for six months, and has already been blistered, I do not think he will be a good subject for treatment.

# LIVE STOCK ROYAL SHOW

**SEPTEMBER 12th, 13th, 14th, 15th, 16th.**

## ENTRIES CLOSE

at 23, Waymouth St., Adelaide.

Cattle, Dairy Cow, Sheep, Fat Stock, Horses, Swine, Poultry, Pigeons, Dogs, Cats, Dairy Produce and Appliances, Agricultural Machinery, Industries and Manufactures, Public School Children's Competition, Sheaf Tossing, Horse Shoeing

Friday, August 11th, at 4 p.m.

Export Butter .. .. Wednesday, July 19, at 4 p.m.

Horses in Action .. .. Wednesday, Aug. 30, at 4 p.m.

Fruit (classes 1070 to 1072) .. Monday, July 31, at 4 p.m.

Floriculture (plants in pots) .. Wednesday, Sept. 6, at 4 p.m.

Entries Close at Exhibition, North Terrace, for Fruits (except classes 1070-1072), Vegetables, Floriculture (except Plants in Pots), on Thursday, September 14th, up to 9 a.m.

PRIZE LISTS AND ENTRY FORMS SENT ON APPLICATION TO

J. A. RILEY, Secretary, 23, Waymouth Street.

## DEPARTMENTAL DOINGS.

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The Director of Agriculture (Professor Arthur J. Perkins), during June, attended the Conference of Ministers of Agriculture, held in Perth. He visited the Government Farms at Turretfield and Booborowie, and also was present at the Championship Pruning Competitions held at Waikerie.

### HORTICULTURE.

The Horticultural Instructor (Mr. George Quinn) visited Clarendon, and in the orchard of Mr. A. L. Morphet gave a pruning demonstration; in the evening Mr. Quinn lectured on the subject of pruning to an audience of members of the local Branch of the Agricultural Bureau. This officer also visited orchards in the Torrens Gorge, and at Pastanbul and Bankside, where he made inquiries respecting olive varieties. At the Wirrabara Forest he gave a pruning demonstration, and at Waikerie attended the Championship Fruit Tree and Grape Vine Competitions. The annual course of lectures and demonstrations in fruit culture at the School of Mines has been commenced, approximately 100 students attend.

Mr. J. B. Harris (Horticultural Instructor, Northern District) demonstrated the practice of pruning at Williamstown, and also addressed a meeting of the local Branch of the Agricultural Bureau.

### GENERAL.

The Secretary Advisory Board of Agriculture (Mr. H. J. Finnis) visited Tarlee, and addressed the recently formed Branch of the Agricultural Bureau on the aims and objects of the institution, and its relationship to the Department of Agriculture. He also attended the Championship Pruning Competitions at Waikerie, and the annual meeting of the Strathalbyn Branch of the Agricultural Bureau.

The Instructor for Mallee Lands (Mr. C. P. Hodge) addressed meetings of Branches of the Agricultural Bureau during the month of June at the following centres:—Teal Flat, Netherton, and Coomandook, and also made farm to farm visits in Mindarie, Coomandook, and Halidon districts. Toward the end of the month he left Adelaide, *via* Wallaroo, to visit Yadnarie district, on Eyre Peninsula, and address a meeting of the local Branch of the Bureau.

### POULTRY.

The Poultry Expert and Lecturer (Mr. D. F. Laurie) visited Pomoota and Loxton.

### DAIRYING.

The Dairy Expert (Mr. P. H. Suter) visited Murray Bridge and Pinnaroo, where he addressed a meeting of the local Branch of the Agricultural Bureau.

The Assistant Dairy Expert (Mr. H. J. Apps) visited cheese factories and dairymen in the Mount Gambier district. He addressed the Mount Gambier and Moorak Branches of the Agricultural Bureau and a meeting of the Herd Testing Society. He also visited dairymen in the Mount Barker and suburban areas.

## FRUIT TREES AND GRAPE VINE PRUNING.

### COMPETITIONS ON RIVER MURRAY.

The series of fruit trees and grape vine competitions organised by the Branches of the Agricultural Bureau on the River Murray Settlements, concluded with the Championship Competitions, which were held on Wednesday and Thursday, June 21st and 22nd. Details of the classes and competitions were published in the June issue of the *Journal*, page 944. The results are as follow:—

#### YOUNG VINE AND TREE COMPETITION.

##### BERRI.

Certificates awarded (names set out in each section in order of merit):—*Sultana Section*.—A. W. Magarey, R. F. Halliday, L. A. Chapple. *Currant Section*.—A. W. Magarey, W. H. Harris, A. V. Stidson, H. Brand, L. A. Chapple, H. W. von Bertouch, R. F. Halliday, R. Fluris. *Doradillo Section*.—W. H. Harris, L. A. Chapple, H. Brand, H. W. von Bertouch, L. C. Pennyfield, R. F. Halliday, A. Nicol. *Apricot Section*.—L. A. Chapple, A. W. Magarey, W. H. Harris, H. W. von Bertouch, L. C. Pennyfield. *Peach Section*.—L. C. Pennyfield, L. A. Chapple, A. W. Magarey, H. W. von Bertouch.

##### MOOROOK.

*Sultana Section*.—A. A. Wuttke, L. A. King, H. Puddy, S. Sanders, jun., P. S. Stubbs. *Currant Section*.—H. Puddy, L. A. King, S. Sanders, jun., F. Carne. *Gordo Section*.—F. Carne, L. A. King, S. Sanders, jun. *Apricot Section*.—H. Puddy. *Pear Section*.—H. Puddy, S. Sanders, jun. *Peach Section*.—H. Puddy, S. Sanders, jun.

#### DISTRICT COMPETITIONS (MATURED VINES AND TREES).

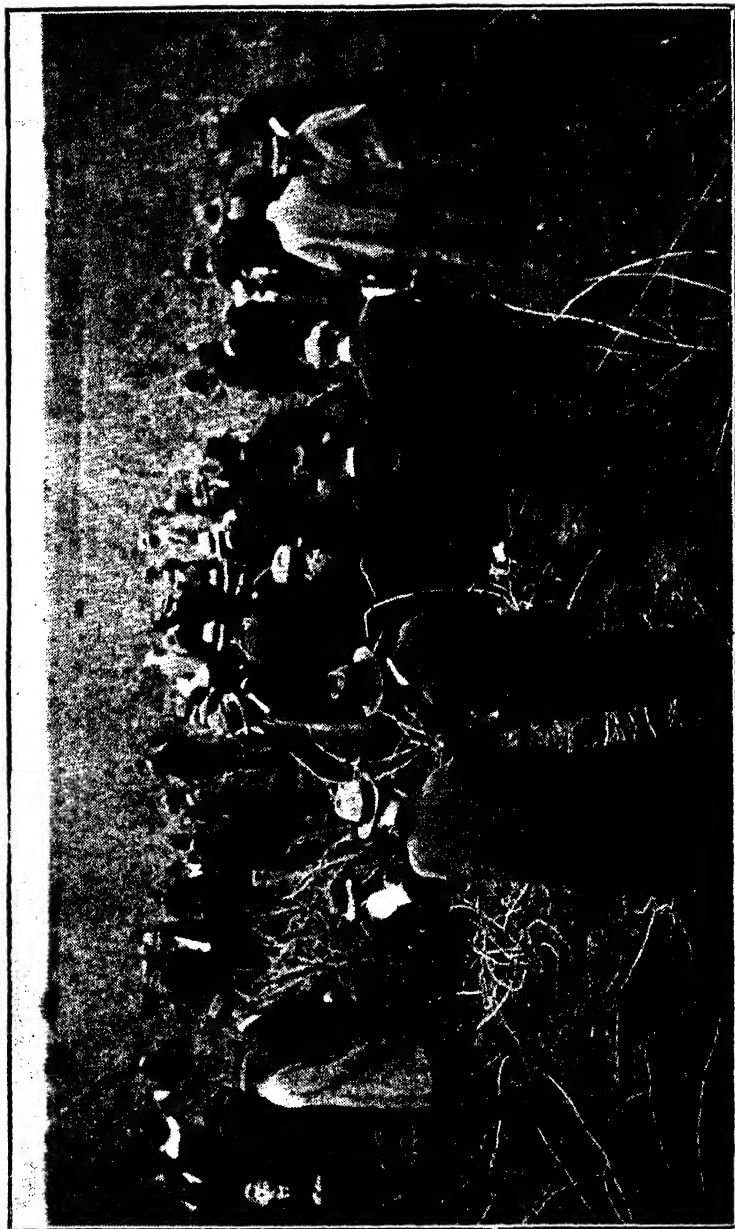
##### BERRI.

*Sultana Section*.—H. W. von Bertouch, W. H. Harris, R. F. Halliday, A. W. Magarey, L. A. Chapple, W. A. Wright, J. T. Robertson, B. H. Jungfer, E. B. Jungfer. *Currant Section*.—L. A. Chapple, A. W. Magarey, R. Fluris, R. F. Halliday, W. H. Gallary, E. R. Moss, W. H. Harris, H. W. von Bertouch, L. C. Pennyfield, P. M. Wilksch, T. J. Robertson, B. H. Jungfer. *Gordo Section*.—H. W. von Bertouch, R. F. Halliday, L. A. Chapple, A. W. Magarey, P. M. Wilksch. *Apricot Section*.—H. W. von Bertouch, L. A. Chapple, L. C. Pennyfield, W. H. Harris, A. W. Magarey. *Peach Section*.—H. W. von Bertouch, L. A. Chapple, W. H. Harris, E. R. Moss. *Pear Section*.—L. A. Chapple, W. H. Harris, L. C. Pennyfield, H. W. von Bertouch, E. R. Moss.

##### MOOROOK.

*Sultana Section*.—L. A. King. *Currant Section*.—L. A. King, S. Sanders, jun., H. Puddy. *Gordo Section*.—L. A. King, S. Sanders, jun. *Apricot Section*.—S. Sanders, jun., P. S. Stubbs, H. Puddy. *Peach Section*.—H. Puddy, S. Sanders, P. S. Stubbs. *Pear Section*.—No certificates awarded.





River Murray Fruit Tree and Grape Vine Pruning Competitions. General View of Operations in the Championship Events at Walkerie.

## WAIKERIE.

*Sultana Section*.—W. Parkes, F. Dunstone, C. Smith, J. Curtis, E. Miller, J. Boehm, C. Boehm, A. E. Perry, J. Virgo, A. Hall. *Currant Section*.—T. Taylor, J. Virgo, W. Parkes, F. Dunstone, H. Green, E. Miller, W. Perry, L. Everett, C. Nottage, C. Smith, P. McDonald, A. Hall. *Gordo Section*.—C. Nottage, J. Curtis, W. Perry, G. Perry, T. Taylor, E. Crabbe, E. Miller, C. Boehm, F. Dunstone, W. Parkes, J. Virgo, A. Hall. *Apricot Section*.—F. Dunstone, E. Miller, G. Perry, T. Taylor. *Peach Section*.—C. Boehm, E. Miller, W. Perry, G. Perry, T. Taylor, A. E. Hall. *Pear Section*.—C. Smith.

## CHAMPIONSHIP COMPETITIONS.

For the Championship Competition, which was open to the first, second, and third prize winners in each of the district events, silver cups were awarded, these being won in the Vine Section by Mr. F. Dunstone, Waikerie; Tree Section, Mr. H. von Bertouch, Berri.

The judging of the championship events was done by Mr. C. G. Savage (Manager of the Government Experimental Orchard at Berri), with the assistance of Messrs. H. Lehmann and B. Pickering.

## CAROB SCALE.

“Is it correct that carob trees are subject to scale, and should never be grown anywhere near orange and lemon trees?” asks a correspondent.

In reply, the Horticultural Instructor (Mr. George Quinn) says carob trees are particularly attacked by a flat, black scale, known as *Aspidiotus rossii*, which, however, does not transfer its attention to orange and lemon trees. The carob, however, is liable to be attacked by the orange red scale (*Aspidiotus aurantii*), and thus become a source of infection to adjoining citrus trees; but as far as our observations go, the carob trees are first infected by the orange red scale through the agency of citrus trees, as this particular scale does not appear to attack the carob indiscriminately in the absence of citrus trees. It may be a carrier, and therefore a menace, should the red scale exist in citrus trees nearby.

## BRAN AND POLLARD.

Representatives of the South-Eastern Branches of the Agricultural Bureau, who met in conference at Mount Gambier recently, resolved to ask the Government to introduce legislation designed to protect purchasers against the sale of adulterated bran and pollard. The resolution of the Conference was submitted to the Director of Chemistry (Dr. W. A. Hargreaves). Dr. Hargreaves was asked to state whether any instances of the adulteration of bran and pollard had come under his notice, and at the same time to suggest how, in his opinion, such adulteration, if any, might be prevented.

Dr. Hargreaves reported as follows:—

The South-Eastern Conference of the Agricultural Bureau recently held at Mount Gambier drew attention to a desire that has been frequently expressed, both in this and the other States, for legislation to prevent the sale of adulterated bran and pollard. It has from time to time been suggested that standards should be fixed for bran and pollard, but this is not practicable owing to the nature of these materials and the various ways in which they are prepared for sale.

The fact is that both bran and pollard are "offal." They are products which are discarded during the manufacture of flour. Millers do not make bran and pollard—they make flour, and the bran and pollard are the substances left over which, by their present methods, they do not turn into flour. If wheat were properly milled there would be no bran and pollard, for the constituents of the wheat grain which are taken out and rejected as bran and pollard during the manufacture of flour are those very ingredients which are most necessary for human consumption. Already there are evidences of a world-wide awakening to the seriousness of the present methods of milling wheat, and as an illustration it may be mentioned that the largest baking company in the world, the Ward Baking Company of New York, has this year given up the use of white flour entirely and adopted what the company terms "100 per cent. whole wheat flour." As this company produces about 100 tons of bread per day, and has about 17,000 distributing agencies, it will be evident that it is actuated by no mere fad.

Other bakers are sure to follow, and it is only a question of a little time before bran and pollard will be off the market. Its place will probably be taken by the discarded inferior grain and the siftings and washings of the grain which is subsequently to be ground to flour. Indeed, much of the pollard that has been sold during the last few years has been merely ground up grain. Whether, however, we regard things as they are at present or as they will probably be in the near future, in both cases a high standard of quality for offal is likely to act detrimentally with respect to the people's food and from the point of view of the Food and Drugs Act the fixing of a high standard for bran and pollard should, in my opinion, be discouraged.

Apart from the foregoing considerations, there are great difficulties in the way of fixing standards for bran and pollard. These difficulties arise out of the fact that bran and pollard are by-products in the manufacture of something else, namely, flour. The purpose of using bran and pollard is, of course, as food material for stock and fowls, and consequently they are to be judged by their food values. To determine what food value standards might be fixed for bran and pollard, an investigation was made in this Department, which included analyses of all mill products, samples being submitted by the leading millers in this State. As a result of this investigation, it was found that a satisfactory chemical standard could not be fixed to cover all kinds of wheat and all methods of milling. Incidentally, it was found that the food values of bran and pollard were higher than that of flour. For instance, the protein of both bran and pollard is generally higher than 14 per cent., whereas the standard for flour, under the Food and Drugs Regulations, is only 7½ per cent.

The chief complaints that are made respecting bran and pollard refer to the fact that substances sold as bran and as pollard are not what are ordinarily known under these names, and it becomes not so much a question of standards as of *definitions* setting out what constitutes bran and what constitutes pollard.

#### THE DIFFICULTY OF DEFINITION.

Inferior and damaged grain (sometimes badly attacked by weevil) is ground up and graded and called "bran" and "pollard." Such material may be actually unwholesome for stock and poultry. It is therefore necessary in the first instance to define both bran and pollard, but up to the present no one has been able to suggest satisfactory definitions.

In Victoria an attempt was made under the Stock Foods Act to define these substances, but the definitions adopted could never be enforced, and do not appear to be of any real value. Bran was defined as "the outer skin of the wheat grain or berry pure and without admixture of any kind." It is safe to say that no such bran was ever offered for sale in Victoria, and if it were offered for sale no one would recognise it as bran. If the outer skin of the wheat grain were pure and without admixture of any kind, it would have almost no food value whatever.

Again, pollard was defined to "consist of the product of milling wheat (other than flour or bran) from which there shall have been removed all impurities, which, when passing through the warehouse separator, or similar cleaning machinery, are separated by the first and second sieves and third (or sand) sieve, and also by the first aspiration process, and it must also be of a fineness to pass through an 18-mesh sieve." This is a "definition" which is not a definition, as will appear from the following illustration. The chief trouble in the trade is from the man who grinds up inferior and damaged wheat. Such wheat is "milled" and the "pollard" he makes is "other than flour or bran." As the ground wheat is not put through the warehouse separator or similar cleaning machinery, none of the impurities

referred to in the definition will exist, and consequently have not to be removed, and therefore the product can be sold as complying with the definition for pollard, however dirty and unwholesome it may be, provided it is fine enough to pass through an 18-mesh sieve.

Again, even supposing we were dealing with dirty and inferior pollard made in the orthodox way in a flour mill, no one could say in a court that it did not comply with the definition unless he actually saw it made.

In my opinion, standards of this kind are worse than none at all, because they harass the honest man and allow the adulterator to get off. Before *legal* standards can be fixed, satisfactory *legal* definitions of bran and pollard must be framed, and considering the differences in wheats and in milling methods, it is, in my opinion, impracticable to fix legal definitions that will be satisfactory. We have, therefore, to fall back on the ordinary meanings of these words, such as are given in standard dictionaries. Webster defines bran as "the broken coat of the seed of wheat, rye, or other cereal grain, separated from the flour or meal by sifting or bolting; the coarse, chaffy part of ground grain." And pollard is defined as "a coarse kind of bran obtained from wheat and sometimes used for feeding stock." From this it seems that what is generally called pollard in this country is not pollard at all, but something else to which a name has not yet been assigned.

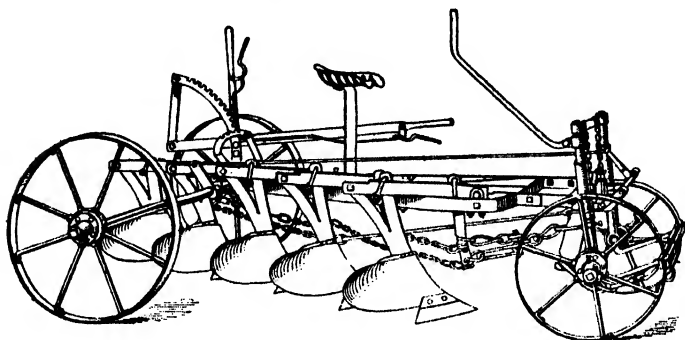
Having in mind the dictionary meanings, we can answer the question asked by the Conference by stating that no samples of adulterated bran have come to our notice except one sample, which was badly infested with mould. Respecting pollard, one sample was adulterated with sand, one consisted of crushed mouldy wheat, and another was composed mainly of weevil dung. The last was the subject of a law case, and it was held by the court that the substance was not pollard. In the other cases also the ordinary processes of law are no doubt sufficient without special legislation, for obviously, sand, mould, and weevil dung are not normal constituents of pollard, however the word may be defined.

In order, however, to better control the sale of bran and pollard, legislation might be passed which would get over the difficulty of having hard and fast definitions and standards, and provide for each manufacturer of stock foods to be registered and for the registration of brands, similar to the Fertilisers Act. Vendors could by this be required to guarantee their products as to nitrogen, fat, carbohydrates, fibre, and moisture, each fixing his own standard. Provisions could be made in the Act for securing the freedom from contamination by weevils, weevil dung, mould, sand, and dirt generally. Such an Act would be difficult to frame and administer, but it offers the only method that I can suggest for the prevention of the adulteration of these food stuffs.

# TRAEGER'S Stump-Jump Implements

Ploughs, 4 to 10 Furrows.

Cultivators, 13 to 21 Tynes.



The illustration shows our standard 5-FURROW FOLLOWING PLOUGH, and is the result of 35 years' practical experience in plough making. As a result of this experience we have no hesitation in offering this plough to farmers that have made a careful study of ploughs, and can honestly say that no better value can be obtained anywhere.

WE ALSO MANUFACTURE

**CULTIVATORS,                      HARROWS,  
HAY TROLLIES.**

Our hay trollies are well known and require very little comment on our part, but we would like to stress the following points:—

**Soundness of Construction and Seasoned Timber, Correct  
Setting of Axles and Alignment, ensuring the Lightest  
Possible Draught.**

ASK FOR AND SEE THAT YOU OBTAIN

**TRAEGER'S CULTIVATOR SHARES**

From your local supplier; if he cannot supply we will be pleased to send your requirements direct.

PRICE LIST AND PRINTED MATTER ON APPLICATION.

**J. G. TRAEGER & SONS,**  
HAMLEY BRIDGE, SOUTH AUSTRALIA.

## EXPERIMENTAL FARM HARVEST REPORTS.

### EYRE PENINSULA EXPERIMENTAL FARM.

[By ROWLAND HILL, Manager.]

This farm consists of 3,041 acres, comprising sections 26, 27, and 28, in the hundred of Minnipa, and is situated 158 miles north of Port Lincoln, on the Port Lincoln to Cape Thevenard railway. It is fairly centrally situated, as concerns the whole of Eyre Peninsula, and is the point from which departmental activities in agricultural matters on that vast stretch of arable land will proceed. The greater part of the farm will be arable when the natural growth is removed. It consists of soils varying from light-colored, light-textured sands, carrying broombush and porcupine, to heavy calcareous soils, with a tendency to run together and set hard. The bulk of the block is between these two extremes, and consists of calcareous soils of medium texture, carrying naturally mallees and large bushes. The land which has been used for cultivation on this farm has been grubbed, and so freed practically of all stumps and roots. The above-mentioned sections were dedicated "a reserve for agricultural purposes" in November, 1914, and work was commenced and a manager appointed on January 1st, 1915.

#### THE SEASON, 1921.

The rainfall, which was 20.88in., although high for this district, did not prove satisfactory for the growing of cereals. The rainfall for the year being as high as it was, with 8.81in. during the "useful" period, might at a glance look quite all right for a good season. When, however, it is taken into consideration that the "useful" rains were distributed over 51 raining days, with scanty falls during July, August, September, and November, and that the major portion of the rain for the year fell in flood rains during January, February, and March, a different aspect presents itself.

The crops certainly suffered considerably during July, August, and September, but made a recovery with the October rains, only to suffer severely again during the latter part of October and the commencement of November, with the result that the majority of the grain was considerably pinched. It was anticipated that at least some of the grubbed area, which was ready to burn, would be ready for seeding. However, the heavy rains during January, February, and March made it impossible to burn, and as a consequence stubble land had to be prepared hurriedly, and the small area of new land which was cleared was seeded somewhat late.

The following table sets out in detail the rainfall recorded, together with that registered at the farm since January, 1915:—

*Rainfall Distribution at Minnipa, 1915-21.*

	1915.	1916.	1917.	1918.	1919.	1920.	Means, 1921. 1915-21.	
	In.	In.	In.	In.	In.	In.	In.	In.
January . . . . .	0.74	0.80	2.02	0.46	0.50	1.02	2.69	1.18
February . . . . .	0.09	0.04	0.40	0.02	2.49	—	4.69	1.10
March . . . . .	0.02	0.44	0.94	0.46	0.02	0.42	3.17	0.78
April . . . . .	1.18	0.27	0.42	0.97	0.58	0.43	0.54	0.63
May . . . . .	2.03	1.23	2.84	1.14	0.66	2.14	2.14	1.74
June . . . . .	1.88	3.67	2.64	1.41	0.74	3.31	2.11	2.25
July . . . . .	2.54	3.60	3.08	0.77	0.70	2.15	0.88	1.96
August . . . . .	3.57	2.55	3.17	2.68	0.81	2.83	0.78	2.34
September . . . . .	0.98	2.33	2.81	0.05	1.32	1.97	0.68	1.45
October . . . . .	0.41	1.92	1.46	1.45	0.65	2.05	1.07	1.29
November . . . . .	—	1.05	1.58	—	0.11	1.40	0.61	0.68
December . . . . .	1.44	0.12	0.33	0.61	1.49	0.36	1.52	0.84
Totals . . . . .	13.88	18.02	21.69	10.02	10.07	18.08	20.88	16.24
Total useful rain, April-November	12.59	16.62	18.00	8.47	5.57	16.28	8.81	12.34

*Distribution of "Useful" Rainfall, Minnipa, 1915-21.*

	1921.	Means, 1915-21.
	In.	In.
Seeding rains (April-May) . . . . .	2.68	2.37
Winter rains (June-July) . . . . .	2.99	4.21
Spring rains (August-October) . . . . .	2.53	5.08
Early summer rains (November) . . . . .	.61	.68
Totals . . . . .	8.81	12.55

**HAY CROPS, 1921.**

Having a good supply of hay on hand, it was not necessary to cut a great amount this year, consequently only about 40 acres were cut. The average hay yield for the year, 1 ton 7cwt. 48lbs., shows that the crop growth was better than would be estimated from the grain yields. This also supports the contention that had it not been for the hardships that grain crops had to contend with in early November and the latter part of October, much better grain returns could reasonably have been expected.

The hay returns from field 13A were satisfactory, when it is taken into consideration that this was hay stubble from last year, ploughed in April, rolled after ploughing, then drilled early in May. The King's Red was seeded at the rate of 90lbs. seed and 112lbs. super. per acre, and the Scotch Grey oats at the rate of 60lbs. seed and 112lbs. super. per acre. This field was sown under dry conditions, and had the advantage of being sown earlier than the other crops.



## A THOROUGH BUSINESS PROPOSITION.

A Crop of the Genuine Iowa Grown

# HUBAM

Trials made during the past season have proved, without a doubt, that Hubam can be grown under a remarkably wide range of climatic conditions, covering all parts of Victoria, the South of Tasmania, South Australia, and New South Wales, and parts of Western Australia.

It will, in a few months, fully restore the humus and nitrogen taken from the soil by the preceding crop.

THE  
CLOVER  
THAT  
SAVES  
A YEAR.



MORE  
DROUGHT  
RESISTANT  
THAN  
SUDAN  
GRASS.

Hubam is a most remarkable Clover for enriching the land, and yields an abundance of Spring and Summer Pasture, Green Feed, and Hay, which is very palatable to all stock. On account of its quick growth, Hubam is especially valuable for fitting in the rotation between two winter crops of grain, and when sown thickly is an excellent weed destroyer.

### SPECIAL ADVANCE "CASH-WITH-ORDER" PRICES

(Good till July 15th, 1922, only),

11s. per lb.; 2lbs. for 21s.; 3lbs. for 30s.

Add postage for South Australia—1s. 2d. for 11lb; 1s. 8d. for 21lbs.; 2s. 2d. for 31lbs.

Write for Brunning's complete Catechism on Hubam, telling "What it is, What it does, and How to treat the plant."

BOOK YOUR ORDERS WITHOUT DELAY.

# BRUNNINGS

(F. H. BRUNNING PTY., LTD.),

64, ELIZABETH ST., MELBOURNE.

Another matter worthy of notice in the hay yields is the headlands of field No. 2. Owing to the rains causing portion of the soil to wash, and mix several varieties of wheat and oats at one end of the plots, it was necessary to cut this portion out for hay. The varieties included were the six three-quarter-bred King's and various oats, and the result of their growth is pleasing, seeing that it was due to the growth of the wheats mentioned that such a satisfactory return was reaped.

These wheats, namely, Felix, Rajah, Mahrajah, Emperor, President, and Sultan, which are Roseworthy College productions, have behaved particularly well, both as grain and hay yielders, and I strongly advise farmers to give these a good trial where early wheats are necessary. The fact that the remaining yields are low can be accounted for in that the Scotch Grey oats and Algerian oats in field No. 6 were on stubble land, which had to be hurried in, and were sown rather late. The same can be said of headlands in fields Nos. 5 and 6, and also on fields Nos. 16 and 17, which were new land, and were sown late, because it was impossible to get them cleared earlier.

The yields of hay received from these various crops, together with the farm average for the year, are set out below:—

### *Hay Yields, Minnipa, 1921.*

Kind.	Field.	Area. Acres.	Total Yield.		Yield per Acre.
			T.	C. LBS.	T. C. LBS.
King's Red . . . . .	No. 13A	17.49	25	0 0	1 8 66
Scotch Grey Oats . . . . .	No. 13A	4.83	9	0 0	1 17 30
Wheat (headlands) Nos. 16 & 17		1.22	15	0	12 33
Scotch Grey oats . . . . .	No. 6	3.81	4	0 0	1 1 0
Algerian oats . . . . .	No. 6	6.18	6	0 0	19 47
Wheat (headlands) . Nos. 5 & 6		3.86	2	12 56	13 67
Wheat and oats (headlands) No. 2		3.72	9	0 0	2 9 31
Farm average . . . . .			41.11	56 7 56	1 7 48

### *Hay Returns, Minnipa, 1915-21.*

Year.	Total Rainfall.	Useful Rainfall.	Area. Acres.	Total Yield.		Yield per Acre.
	In.	In.		T.	C. LBS.	T. C. LBS.
1915 . . . . .	13.88	12.59	148	280	0 0	1 17 94
1916 . . . . .	18.02	16.62	2.34	4	0 0	1 14 19
1917 . . . . .	21.69	18.00	47.85	82	10 0	1 14 54
1918 . . . . .	10.02	8.47	30.60	28	0 0	18 34
1919 . . . . .	10.07	5.57	55.13	35	0 0	12 78
1920 . . . . .	18.08	16.28	62.99	165	15 93	2 12 72
1921 . . . . .	20.88	8.81	41.11	56	7 56	1 7 48
Means . . . . .	16.9	12.33	—	—	—	1 11 9

## OAT CROPS.

The area sown to oats for grain was small, namely, 15.65 acres. Of this, 5.21 acres were stubble land in field No. 13A, and the remainder fallow in field No. 2.

Field No. 13A was ploughed in April, rolled after ploughing, and seeded early in May with 60lbs. seed and 112lbs. super. per acre, under dry conditions. Field No. 2 was ploughed in July, 1920, cultivated in September, harrowed at the end of September, cultivated in October, again in November, March, and April. This field was again cultivated ahead of the drill, and was seeded at the rate of 60lbs. seed and 112lbs. super. per acre, commencing the second week in May. The increased yield of Algerian oats on stubble land, compared with the same oats sown later on fallow, can be taken as evidence that oats must be sown early here, and not later than the first week in May, but better in April, if circumstances will allow.

Taking the season into consideration, the farm average of 28bush. 5lbs. is quite satisfactory, and suggests that oats will occupy a much larger area in these districts in the near future.

The yields secured from the varieties of oats grown are shown in the next table, with the farm average for the period :—

*Yields of Oat Varieties, Minnipa, 1921.*

Variety.	Field.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Algerian . . . . .	No. 13A	5.21	192 23	37 0
Cape . . . . .	No. 2	1.30	43 27	33 24
Scotch Grey . . . . .	No. 2	2.74	80 39	29 22
Algerian . . . . .	No. 2	2.62	68 31	26 10
Buakura . . . . .	No. 2	1.02	20 18	20 2
Sunrise . . . . .	No. 2	1.39	21 10	15 12
Goldfinder . . . . .	No. 2	1.37	12 4	8 33
Farm average . . . . .		15.65	440 2	28 5

*Oat Returns, Minnipa, 1916-21.*

	Total Rainfall. In.	Useful Rainfall. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
1916 . . . . .	18.02	16.62	49.90	1,987 20	39 33
1917 . . . . .	21.69	18.00	10.39	461 22	44 17
1918 . . . . .	10.02	8.47	21.03	568 12	27 1
1919 . . . . .	10.07	5.57	14.75	85 16	5 32
1920 . . . . .	18.08	16.28	20.92	903 30	43 8
1921 . . . . .	20.88	8.81	15.65	440 2	28 5
Means . . . . .	16.46	12.29	—	—	31 36

In addition to these oats mentioned, a number of new varieties, in quantities too small to test their yields, were obtained from Roseworthy College and grown this year. The majority of these show

promise of being valuable additions to this district, and their behavior in the future will be interesting to follow. These varieties are:—Stark's Hooimaker, Smyrna, Kelsall's, Kherson, Bathurst Early, Bathurst No. 4, Cowra 22, Lachlan, Guyra.

The following table sets out in detail the behavior of the varieties of oats tried at Minnipa from 1917-21:—

*Oat Variety Yields, Minnipa, 1917-21.*

Variety.	1917.	1918.	1919.	1920.	1921.	Means, 1918-21.
	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.
Scotch Grey . . .	44 35	29 37	15 18	44 3	29 22	34 21
Algerian . . . .	37 7	25 12	18 29	45 27	31 25	31 28
Sunrise . . . . .	—	27 2	9 6	34 33	15 12	21 23
Cape . . . . .	—	—	—	48 6	33 24	—
Ruakura . . . . .	—	—	—	25 22	20 2	—
Goldfinder . . . .	—	—	—	30 30	8 33	—
Farm average	44 17	27 1	5 32	43 8	28 5	29 29

**BARLEY CROPS.**

An area of 10.08 acres was seeded to barley on new land, at the rate of 50lbs. seed and 112lbs. super. per acre. This area included four varieties, all of which did reasonably well under the circumstances. They were sown on new land, ploughed at the end of June, harrowed before and after the drill, and drilled in in the first week in July.

*Yields of Barley Varieties, Minnipa, 1921.*

Variety.	Field.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Short Head . . . . .	No. 17	5.03	102 28	28 18
Roseworthy Oregon .	No. 17	1.65	36 42	22 16
Tunis 4 . . . . .	No. 17	1.73	29 14	16 46
Tunis 1 . . . . .	No. 17	1.67	23 17	13 49
Farm average . . . . .		10.08	192 1	19 2

Unfortunately it was impossible to harvest the crop in 1920, hence the omission in the following table. This crop was certainly a heavy one, and would have increased the average. However, the following table will show the averages from 1917-21, omitting 1920:—

*Barley Yields, Minnipa, 1917-21.*

Year.	Total Rain. In.	Useful Rain. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
1917 . . . . .	21.69	18.00	7.13	233 34	32 39
1918 . . . . .	10.02	8.47	11.85	261 39	22 5
1919 . . . . .	10.07	5.57	8.07	49 24	6 7
1920 . . . . .	18.08	16.28	—	—	—
1921 . . . . .	20.88	8.81	10.08	192 1	19 2
Means . . . . .	20.15	11.42	—	—	16 1

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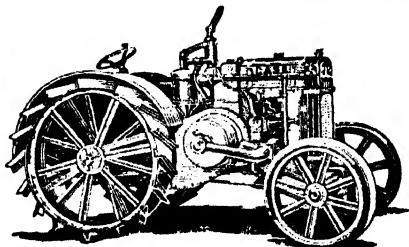
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### RYE CROPS.

Only a small area of this cereal is grown here, but, as in past years, the yield has been low. Only in one year, namely, 1917, has there been anything like a yield, and this is rather remarkable, seeing that this year, as in others, it has made splendid growth. This year it was sown during the first week in July, on new land, which was ploughed at the end of June, harrowed, drilled at the rate of 60lbs. seed and 112lbs. super. per acre, and harrowed after the drill.

#### *Rye Returns, Minnipa, 1917-21.*

Year.	Total Rainfall. In.	Useful Rainfall. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
1917 . . . . .	21.69	18.00	3.86	61 54	16 2
1918 . . . . .	10.02	8.47	2.72	21 36	7 56
1919 . . . . .	10.07	5.55	1.92	2 38	1 22
1920 . . . . .	18.08	16.28	2.02	10 34	5 14
1921 . . . . .	20.88	8.81	1.82	11 44	6 26
Means . . . .	20.15	11.42	—	—	7 24

### WHEAT CROPS.

Of the many varieties tested on this farm, a number have been discarded. Those retained are the wheats judged to be best suited to the conditions. As pointed out previously, the weather conditions prevented much new land being cleared up for seeding. This made it necessary to resort to what fallow land there was, and seed some of last year's stubble. The majority of the varieties were grown on fallow land in field No. 2, which had the following treatment:—Ploughed July, 1921; cultivated September, harrowed October, cultivated October, cultivated November, cultivated March (1922), cultivated April, cultivated ahead of the drill in May.

In all cases, excepting where cultivation was done to loosen the surface, the necessary work could have been done equally as well with sheep. Although there might seem a number of cultivations, with the absence of sheep they were quite necessary; from which it can be assumed that so soon as this district has settled down to better agricultural methods, and farmers realise that bare fallow is absolutely necessary, sheep are going to be a great asset.

In all cases of wheat on bare fallow, the seeding was at the rate of 60lbs. seed and 112lbs. super. per acre. Fields Nos. 5 and 6, which were stubble land, were ploughed during May and June, and seeded at the rate of 60lbs. seed and 112lbs. super. per acre. Fields Nos. 17 and 16 were cleared up during April, May, and June, ploughed during latter part of June, and harrowed before and after the drill.

*Wheat Variety Yields on Fallow, Minnipa, 1921.*

Variety.	Field.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Emperor . . . . .	No. 2	2.26	39 48	17 37
Mahrajah . . . . .	No. 2	1.94	32 52	16 56
President . . . . .	No. 2	2.62	40 58	15 38
Sultan . . . . .	No. 2	3.24	46 50	14 27
Felix . . . . .	No. 2	3.21	45 23	14 18
Gluyas . . . . .	No. 2	12.95	153 57	11 53
Rajah . . . . .	No. 2	3.34	39 28	11 49
Currawa . . . . .	No. 2	11.18	121 50	10 54
Late Gluyas . . . . .	No. 2	4.55	44 51	9 51
Federation . . . . .	No. 2	7.96	75 5	9 26
King's White . . . . .	No. 2	12.90	117 56	9 9
Smutproof . . . . .	No. 2	2.26	20 23	9 1
Fortune . . . . .	No. 2	8.51	72 21	8 30
Silver Baart . . . . .	No. 2	3.12	23 47	7 37
Baroota Wonder . . . . .	No. 2	3.46	26 7	7 33
Red Russian . . . . .	No. 2	3.01	21 12	7 3
Walker's Wonder . . . . .	No. 2	3.17	19 18	6 2
Yandilla King . . . . .	No. 2	3.59	17 57	5 0
Marshall's No. 3 . . . . .	No. 2	3.12	10 49	3 28
Average for fallow . . . . .		96.39	970 42	10 4

*Wheat Variety Yields on "New Land," Minnipa, 1921.*

Variety.	Field.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Caliph . . . . .	No. 16	6.53	74 56	11 29
Canaan . . . . .	No. 16	7.76	60 13	7 46
Queen Fan . . . . .	No. 16	11.66	73 13	6 17
Farm average (new land) . . . . .		25.95	208 24	8 2

*Wheat Variety Yields on Stubble Land, Minnipa, 1921.*

Variety.	Field.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
King's Red . . . . .	No. 13A	4.45	81 6	18 13
Caliph . . . . .	No. 6	7.16	90 34	12 39
Queen Fan . . . . .	No. 5	16.20	185 41	11 28
Canaan . . . . .	No. 5	19.64	198 21	10 6
Federation . . . . .	No. 5	17.79	172 5	9 40
Gluyas . . . . .	No. 5	18.99	88 55	4 41
Mixed wheats . . . . .	No. 5	13.39	62 36	4 41
Farm average (stubble land) . . . . .		97.62	879 18	9 0

*Farm Wheat Average, Minnipa, 1921.*

Where grown.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Fallow .. . . .	96.39	970 42	10 4
New land .. . . .	25.95	208 24	8 2
Stubble land .. . . .	97.62	879 18	9 0
Farm average of wheat	219.96	2,058 24	9 21

King's Red on stubble land has yielded the highest returns for the farm, and this can be accounted for by the fact that it was seeded early for hay, which is further evidence of the necessity for having seeding done early in this district.

The next table shows the averages for each year since 1916, also the mean yield for the period 1916-21.

*Wheat Returns, Minnipa, 1916-21.*

Year.	Total Rainfall. In.	Useful Rainfall. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
1916. . . .	18.02	16.62	171.73	4,908 6	28 35
1917. . . .	21.69	18.00	76.65	1,999 34	26 5
1918. . . .	10.02	8.47	141.37	3,022 55	21 23
1919. . . .	10.07	5.57	112.52	980 40	8 43
1920. . . .	18.08	16.28	196.51	5,040 8	25 39
1921. . . .	20.88	8.81	219.96	2,058 24	9 21
Means .	16.46	12.29	—	—	19.58

The average yield of 19bush. 58lbs. over a period of six years is sufficient to demonstrate that this district is well suited to the growing of cereals. Four years out of the six have resulted in splendid returns, but the remaining two years have reduced the average considerably. Nevertheless, the average of 19bush. 58lbs. on an average rainfall of 16.46in. is a pleasing return.

In the next table the wheat crops grown on the farm have been separated according to the soil condition in which they were grown, but owing to the fact that no fallow land was available in 1917, the mean yields are taken for the four seasons, 1918-21.

*Wheat Yields from Various Soil Treatments, Minnipa, 1918-21.*

Year.	Total Rainfall. In.	Useful Rainfall. In.	Fallow. Bush. lbs.	New Land. Bush. lbs.	Stubble Land. Bush. lbs.	Farm Average. Bush. lbs.
1918 .	10.02	8.47	23 44	14 12	18 14	21 23
1919 .	10.07	5.55	9 36	9 21	3 11	8 43
1920 .	18.08	16.28	30 8	22 38	13 5	25 39
1921 .	20.88	8.81	10 4	8 2	9 0	9 21
Means, 1918-1921	14.76	9.83	18 23	13 33	11 3	16 17

The next table will show the behavior of various varieties on fallow from 1918-21. A number of other varieties were tested during this period, but have been discarded. The varieties in the following table have all been grown on fallow in each of these years, so can be fairly compared.

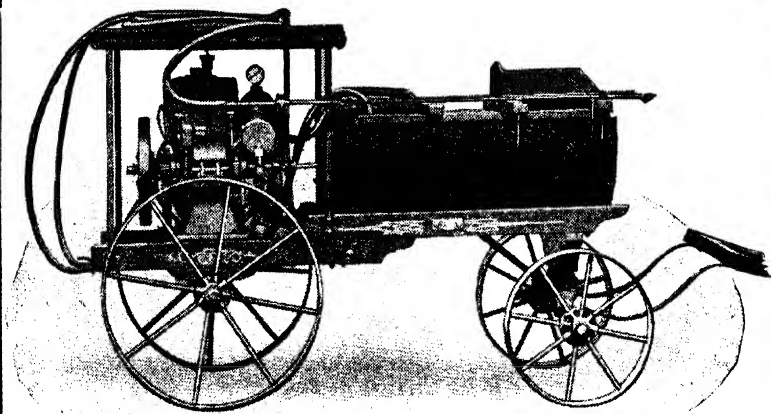


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*Yields of Wheat Varieties on Fallow, Minnipa, 1918-21.*

Variety	Means,				
	1918.	1919.	1920.	1921.	1918-1921.
	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.	Bush. lbs.
Felix . . . . .	25 29	15 22	32 37	14 8	21 54
Sultan . . . . .	24 17	15 26	32 38	14 27	21 42
President . . . . .	23 57	14 0	32 53	15 38	21 37
Emperor . . . . .	23 20	12 54	30 43	17 37	21 8
Mahrajah . . . . .	23 7	12 25	29 43	16 56	20 33
Gluyas . . . . .	24 32	11 29	31 23	11 53	19 49
Rajah . . . . .	24 31	12 37	30 12	11 49	19 47
Red Russian . . . . .	25 48	10 48	35 10	7 3	19 42
King's White . . . . .	27 27	7 4	32 17	9 9	18 59
Late Gluyas . . . . .	25 2	13 9	26 16	9 51	18 35
Walker's Wonder . . . . .	23 42	11 43	31 35	6 2	18 16
Smutproof . . . . .	24 42	8 10	29 51	9 1	17 56
Federation . . . . .	21 49	10 25	29 19	9 26	17 45
Silver Baart . . . . .	25 57	8 57	27 30	7 37	17 30
Fortune . . . . .	27 5	7 33	25 54	8 30	17 13
Baroota Wonder . . . . .	17 29	8 30	33 17	7 33	16 42
Marshall's No. 3 . . . . .	20 45	9 5	31 0	3 28	16 5
Yandilla King . . . . .	20 49	7 47	30 15	5 0	15 58
Currawa . . . . .	—	—	35 48	10 54	—
Farm average . . . . .	23 53	10 25	30 58	10 19	18 54
Rainfall . . . . .	10.02in.	10.07in.	18.08in.	20.85in.	14.76in.

From the above table it will be seen that over a period of four seasons, which have been varied, the five wheats yielding highest returns are all three-quarter-bred King's, and are, it might be pointed out for the benefit of those farmers who are prejudiced against bearded wheats, beardless varieties. The next in order are Gluyas and Rajah, the former being well known over most of the wheat-growing areas, but not valued enough in some. Rajah is another beardless three-quarter-bred King's. In addition to these three-quarter-bred King's varieties being the highest yielders, they are excellent hay wheats, retaining to a great extent the qualities of King's.

## EXPERIMENTAL PLOTS.

A number of experiments have been conducted on new land, and these are as follows: Testing the sowing of different rates of seed per acre, all plots having a dressing of super. at the rate of 112lbs. per acre, and the results are tabulated next.

*Rates of Seeding Tests with Wheat on New Land, Minnipa, 1921.*

Seed per Acre.	Area.	Total Yield.	Yield per Acre.
	Acres.	Bush. lbs.	Bush. lbs.
30lbs. Queen Fan . . . .	1.56	10 9	6 30
40lbs. Queen Fan . . . .	2.61	17 41	6 47
50lbs. Queen Fan . . . .	1.62	9 51	6 4
60lbs. Queen Fan . . . .	1.28	7 48	6 6
75lbs. Queen Fan . . . .	1.28	7 43	6 2
90lbs. Queen Fan . . . .	1.28	7 2	5 30

*Rates of Seeding Tests with Wheat on New Land, Minnipa, 1918-21.*

## Yield per Acre.

Year.	Rain-fall. Ins.	30lbs.	40lbs.	50lbs.	60lbs.	75lbs.	90lbs.	Farm Average.
		Seed. B. L.	Seed. B. L.	Seed. B. L.	Seed. B. L.	Seed. B. L.	Seed. B. L.	
1918	10.02	16 26	17 34	15 52	17 12	14 17	17 43	14 12
1919	10.07	10 10	9 41	10 26	11 53	13 31	12 9	9 21
1920	18.08	6 44	7 51	10 41	8 55	11 35	10 31	22 38
1921	20.88	6 30	6 47	6 4	6 6	6 2	5 30	8 2
Means	14.76	9 58	10 28	10 46	11 4	11 21	11 28	13 33

From this table it will be seen that there is a gradual increase of yields (over this period) for additional seed sown; but extra yield obtained from sowing in excess of 60lbs. of seed per acre does not prove to be an advantage in this case. Although the yield is increased, it is not done so in proportion to seed sown.

## QUANTITATIVE MANURE TESTS.

These were again conducted this year. Thus results are now available for a period of six years.

*Manurial Tests with Wheat on New Land, Minnipa, 1921.*

	Manuring per Acre.	Area. Acres.	Total Yield.	Yield per Acre.
			Bush. lbs.	Bush. lbs.
No manure	.....	1.03	3 19	3 13
$\frac{1}{2}$ wt. superphosphate	.....	1.10	7 40	6 58
1wt. superphosphate	.....	1.05	9 1	8 35
2cwts. superphosphate	.....	1.06	9 25	8 53
3cwts. superphosphate	.....	1.10	9 14	8 24

*Manurial Tests with Wheat on New Land, Minnipa, 1916-21.*

Year.	No Manure.	$\frac{1}{2}$ wt. Super.	1wt. Super.	2cwts. Super.	3cwts. Super.	Farm Average.	Rain- fall. Ins.
	B. L.	B. L.	B. L.	B. L.	B. L.		
1916	19 56	22 55	24 11	28 35	—	24 41	18.02
1917	15 35	26 48	29 39	31 17	31 9	26 18	21.69
1918	8 6	10 47	9 53	10 38	13 46	14 12	10.02
1919	2 44	6 12	7 47	10 7	9 57	9 21	10.07
1920	19 36	21 54	20 54	21 16	24 9	22 38	18.08
1921	3 13	6 58	8 35	8 53	8 24	8 2	20.88
Means,							
1917-21	9 51	14 44	15 22	16 26	17 29	16 6	16.15

Unfortunately, there was not a 3cwt. super. dressing test conducted in 1916, so that the average can only be taken for period 1917-21. Canaan seed was used in these tests this year, at the rate of 60lbs. per acre. For this period the  $\frac{1}{2}$ wt. super. dressing shows a big lift in yield over the no-manure test, and from this on there is an increased yield by applying 1wt. of super. Such is again the case with the 2cwt. and 3cwt. applications.

*Cultivation Tests on New Land, Minnipa, 1921.*

Land ploughed and harrowed, June, 1921:—

	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
Harrowed . . . . .	1.09	13 8	12 3
Once rolled . . . . .	1.09	11 8	10 13
Thrice rolled and cultivated twice. . . .	1.09	13 13	12 8
Twice rolled and cultivated once . . . .	1.09	14 52	13 38

These plots were seeded with Caliph seed at the rate of 60lbs. seed and 112lbs. super. per acre.

**IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC.**

During the month of May, 1922, 2,934bush. of apples, 11,877bush. of bananas, 235bush. of passion fruit, 125bush. of pineapples, 42 packages of carrots, 15,402 bags of potatoes, 75 packages of cocoanuts, 9 packages of peanuts, 61 packages of trees, 31 packages of plants, 69 packages of seeds, 34 packages of bulbs, and 1,806 empty wine casks were examined and admitted at Adelaide and Port Adelaide, under the Vine, Fruit, and Vegetable Protection Acts, 1885 and 1910. Of these, nine empty wine casks and 61 packages of trees were fumigated, and 45bush. of bananas and 2bush. of apples (over ripe) and 2 second-hand bags were destroyed.

Under the Federal Commerce Act, 976 packages of fresh fruit, 38,639 packages of dried fruit, 410 packages of citrus fruit, 1 package of jam, and 19 packages of plants were exported to oversea markets. These were consigned as follows:—To London—35,318 packages of dried fruit, 132 packages of pears, 724 packages of apples, 20 packages of grapes, 1 package of jam. To New Zealand—1,325 packages of dried fruit, 19 packages of plants, 410 packages of citrus fruit. To India and East—311 packages of dried fruit, 100 packages of apples. To South Africa—1,685 packages of dried fruit.

Under the Federal Quarantine Act, 5,039 packages of seeds, &c., were examined and admitted from oversea sources.

*Interstate Imports.—Examined at Mount Gambier, May, 1922.*

	Packages.	Bushels.
Bananas . . . . .	67	101
Pineapples . . . . .	3	5
Apples . . . . .	163	163
Nuts . . . . .	4	4
Cabbages . . . . .	61	—
Cauliflowers . . . . .	41	—
Mixed vegetables . . . . .	1	—
Grass roots . . . . .	2	—
Shrubs . . . . .	1	—
Fruit trees . . . . .	1	—

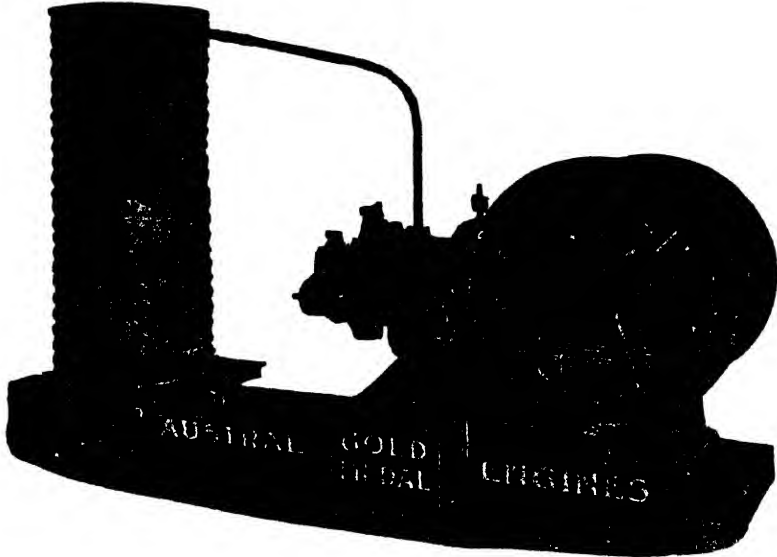
Of these 1 package of fruit trees was fumigated, and 5bush. of bananas (over ripe) were destroyed.

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## DAIRY CATTLE IMPROVEMENT.

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The Dairy Cattle Improvement Act, 1921, provides for the establishment of a fund to be called the "Dairy Cattle Fund." Into this fund all licence fees and penalties imposed for offences against the Act are to be paid, and "applied to improving the standard for dairy cattle, and generally to promoting and encouraging the dairying industry of the State, and to no other purpose." The Minister of Agriculture (Hon. T. Pascoe, M.L.C.) has announced that it is proposed to offer subsidies to purchasers of pure-bred bulls under the following conditions:—

It is proposed to hold special sales of pure-bred bulls from time to time. The purchasers of bulls, whose dams can show satisfactory milking records on standards to be fixed shortly, will be eligible for Government subsidies, subject to conditions indicated below.

Subject to arrangements with the Royal Agricultural Society, it is proposed to hold the first sale on the Show Grounds on Thursday afternoon of show week in September, 1923. If sufficient inducement offers, sales will also be held at selected country centres. It is believed that these sales will help to eliminate inferior bulls, and the owners of meritorious pedigree stock will find a more ready sale for their bulls. It is hoped, therefore, that owners will take the earliest opportunity to have their cows submitted to official tests.

Conditions governing these sales and the subsidies are indicated below:—

### 1.—*Conditions Governing Sale of Pure-bred Bulls.*

(a) The bulls shall be registered in the Herd Books, or be eligible for Herd Book entry.

(b) Bulls must be well grown and true to type.

(c) Bulls shall be not less than 10 months and not more than 5 years from calving.

(d) Owners of bulls 2 years old and over must produce evidence of fruitfulness in the preceding year.

### 2.—*Conditions Governing Sale of Pure-bred Bulls Eligible for Government Subsidy.*

(a) Bulls must comply with all conditions laid down in section 1.

(b) Bulls eligible for Government subsidy shall be the progeny of officially tested stock of satisfactory performance; records agreeing with standards to be fixed.

(c) Bulls for sale cannot qualify for subsidy unless having passed a tuberculin test within six months prior to date of sale.

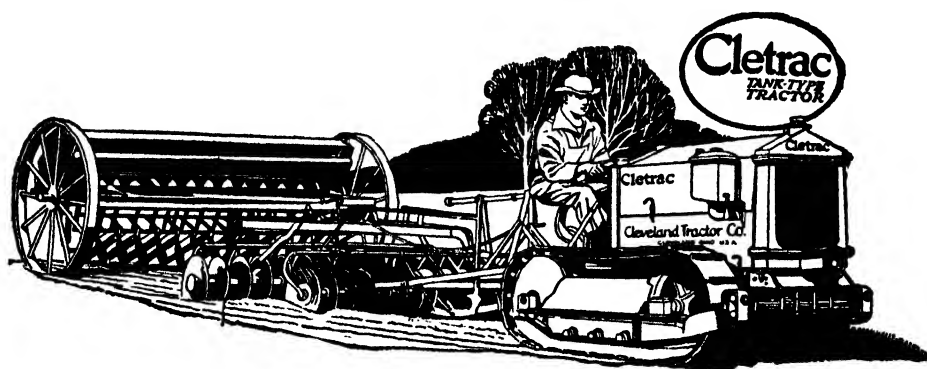
(d) Subject to the following conditions the Government shall offer to approved purchasers of such bulls a bonus of 25 per cent. of the purchase price at the end of the first year, provided that such bonus does not exceed £25, and 12½ per cent. of the purchase price at the end of each of the two subsequent years, provided that such payment does not exceed £12 10s. per year.

(e) The application for bonus to be made on forms supplied at the sale, and indorsed by the auctioneer and Government representative.

(f) Subsidised bulls shall be made available for use of others at a fee not exceeding 10s. per cow. In the case of bulls under 2 years of age, the owner need not accept more than 15 outside cows during the first year, but no subsidy shall be paid unless he can show evidence of having accepted not less than 10 outside cows for the same period. For bulls of 2 years, or over, the maximum number of cows that the owner must accept is raised to 25, whilst the minimum entitling him to a subsidy remains 10.

(g) The owner to supply to Department of Agriculture list of names of owners of cows and dates of service.

(h) The bulls shall be kept under conditions satisfactory to the Department of Agriculture.



ALL FARMERS SHOULD SEE THIS

## WONDERFUL LITTLE GIANT

AT WORK—SEEDING, PLOUGHING, CULTIVATING.

REPLACES EIGHT HORSES. WORKS MORE EFFICIENTLY AND ECONOMICALLY

INQUIRIES INVITED BY

**CHARLES ATKINS & Co., Limited,**

CURRIE STREET, ADELAIDE.

## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, June 14th, there being present Mr. C. J. Tuckwell (chairman), Professor Arthur J. Perkins (Director of Agriculture), Mr. W. J. Colebatch (Principal Roseworthy Agricultural College), Col. Rowell, Messrs. A. M. Dawkins, H. Wicks, T. H. Williams, F. Coleman, Geo. Jeffrey, W. S. Kelly, W. G. Auld, and the Secretary (Mr. H. J. Finnis).

*Stinkwort on Eyre Peninsula.*—An intimation was received from the Railways Commissioner to the effect that stinkwort in the War-ramboo and Tooligie station yards had been destroyed as requested by the Board. It was also stated that the plant was very plentiful on the West Coast, and unless the freight in chaff, sheep, and other carriers of weed seeds was stopped the plant would spread, and that it seemed useless expenditure to cut plants on railway land. The Secretary was instructed to advise the local correspondent who drew attention to the matter in terms of the Commissioner's report.

*Export Trade in Pork.*—A report was received from the manager of the Produce Department intimating that the matter of the export trade in pork had been taken up with the Trade Commissioner.

*Sale of Adulterated Bran and Pollard.*—The Conference of South-Eastern Branches carried the following resolution:—"That a Bill be introduced to prevent the sale of adulterated bran and pollard." The resolution was submitted to the Director of Chemistry asking whether any instances of the adulteration of bran or pollard had come under his notice, and whether the Director could offer any suggestion as to how such adulteration, if any, might be prevented. The Director of Chemistry (Dr. W. A. Hargreaves) has supplied a report (printed elsewhere in this issue). The Secretary was instructed to thank Dr. Hargreaves for his very exhaustive report, and on the motion of Professor A. J. Perkins, seconded by Mr. W. J. Colebatch, it was decided to refer the report to the Minister of Agriculture, with the request that he should forward it on to the Crown Law Office to ascertain whether legislation along the lines suggested was practicable.

*Water Supply in Trucking Yards.*—Communications were received from two Branches requesting the Advisory Board to make application to the Railways Commissioner to have watering facilities placed in the railway yards. The Board was of the opinion that this matter might be dealt with either by the Branches communicating directly with the Commissioner, or through the Parliamentary representatives for the districts concerned.

*Horticultural Investigations.*—A communication was received from the Blackwood Branch asking the Advisory Board to urge the Government to take steps to investigate several horticultural problems with which the growers were faced. Mr. H. Wicks submitted a report



on the matter, and it was decided to send the communication from Blackwood, together with Mr. Wicks's statement, to the Horticultural Instructor (Mr. Geo. Quinn) for comments.

*Proposed Dairy Legislation.*—The sub-committee appointed to peruse the proposed Dairy Bill reported to the Board. It was decided, on the motion of Mr. Colebatch, seconded by Col. Rowell, to return the Bill to the Minister of Agriculture with a request that the Parliamentary Draftsman in preparing a Dairy Bill should include the suggestions incorporated in Mr. Suter's memorandum, at the same time adhering to the Queensland Dairy Act of 1920 as closely as possible.

*Trial Shipment of Fresh Fruit to London.*—The Ironbank Branch requested that full details regarding the trial shipment of soft fruits sent to England last February should be obtained and published in the *Journal of Agriculture*. It was decided to ask the Horticultural Instructor (Mr. Geo. Quinn) to prepare an article for publication.

*Neglected Orchards.*—Correspondence was received from the Williamstown Branch intimating that there were several very old gardens in the surrounding district, that had not for a considerable number of years been sprayed, pruned, and attended to. It was asked that the trees should be removed under the compulsory clauses of the Act. The Secretary was instructed to ask the Horticultural Instructor (Mr. Geo. Quinn) for a report.

# Cyclone

## Metal Gates and Fences.

W. &amp; W., 840

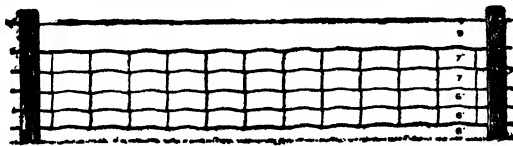


Fig. 7. 5-line Special Cyclone Spring Coil Fence.

The Cyclone Special Sheep Fence, here illustrated, is recognised as the best fence for cross-bred sheep. The top and bottom lines are No. 9 gauge heavily galvanized steel wire; intermediate line wires, No. 11 gauge, with cross ties of No. 13 gauge every 12 inches, immovably fixed to the line wires. You need fewer posts with a Cyclone Spring Coil Fence, and it is very easily erected.

ILLUSTRATED CYCLONE CATALOGUE ON REQUEST.

**CYCLONE Pty., Ltd.,** EXCHANGE BUILDINGS,  
PIRIE ST., ADELAIDE.

Also at Swanston Street, Melbourne, and Ash Street, Sydney.

*Services of a Wool Expert.*—The following resolution was received from the Lake Wangary Branch—"That the Advisory Board be requested to send a wool expert to lecture throughout Eyre Peninsula, if possible not later than September of this year." Mr. Geo. Jeffrey and Mr. W. S. Kelly were appointed to wait on the Minister of Agriculture in connection with this matter.

*Improvement of Dairy Cattle.*—Mr. W. S. Kelly was appointed to represent the Advisory Board of Agriculture on the committee appointed to administer the Fund established under the Dairy Cattle Improvement Act.

*Late Major A. E. M. Norton.*—On the motion of Col. Rowell, seconded by Mr. T. H. Williams, it was resolved that a letter of condolence be sent to the wife and family of the late Major A. E. M. Norton, D.S.O., F.R.G.S.

*New Branches.*—Approval was given for the formation of Branches at Streaky Bay and Pata, with the following gentlemen as foundation members:—Streaky Bay—C. C. Neale, H. H. Old, T. Talbot, A. Cotton, C. Giles, J. F. Gardiner, R. Fleming, W. J. Williams, C. V. Lindquist, R. Abbott, J. T. A. P., and D. T. Kenny, B. Hand, T. C., A. J., and R. Mudge; Pata—R. May, L. R. Christie, F. J. Petch, A. J. Durdin, F. and J. Heitmann, A. W. Mutte, and L. R. Best.

*Branches to be Closed.*—It was decided to close the Cummins and MacGillivray Branches.

*New Members.*—The following names were added to the roll of existing Branches:—Hookina—F. L. Lindblom, P. J. Lindblom, L. Cummings; Rapid Bay—F. Roper, G. Lord, H. Hamlyn; Maitland—E. Arrowsmith; Meadows—T. Latha, W. Latha; Kybybolite—L. Stände; Elbow Hill—D. Watson, T. H. Wildman, A. J. Wildman; Wudinna—G. Shephardson, C. Rowley, L. Grosser, E. J. Barns, W. Plew, W. Walker, H. Spencer; Kangarilla—W. H. Tozer; North Booborowie—F. Gaskell; Mallala—F. Baker, H. C. Sourby; Anyton—A. Wallace; Yachnarie—J. A. Serotzki, H. Degner; Colton—V. Boylan, J. Boylan, J. Ford, B. Johnson, K. Henderson; Parilla Well—C. F. Webster, F. Brook, E. W. Brook, H. H. Brook, F. Hunt, J. Guthleben; Two Wells—L. C. Wilson, A. McRostie, Koonibba—Rev. A. B. C. Hoff, J. R. Bergmann; Winkie—H. E. Dixon; Goode—P. A. Lange; Lenswood and Forest Range—A. Brockhoff, M. Vickers; Murray Bridge—J. Nicholls, E. H. Daniel; Tarlee—C. Bartel, T. Howard, L. Dongal; Mundalla—H. Martlew, J. Ryan; Lone Gum—W. J. Mawby, S. J. H. Ranford, F. Dyer; Coonmandook—A. Saint; Maltee—W. H. Watson, H. Kuhlmann, J. H. Will; Black Springs—H. C. Klingenberg; Cherry Gardens—A. A. Anderson, H. L. Strange; Balhannah—F. Mount, G. Johncock; Block E—N. A. Buckenara, I. Johnstone; Rockwood—R. S. Galpin, M. W. Galpin, G. D. Solly; Paskeville—R. R. Neale, T. R. Schumer; Sandalwood—W. W. Fischer, G. Langford, E. Haemaster, J. Page, L. Page, H. J. Page, H. C. Haemaster, W. R. Cairns, C. K. Cairns, J. H. Matthieson, C. S. Haemaster; Paruna—R. D. Payne, R. B. Petch, C. J. Petch, L. N. Galley, J. Vaughan, W. E. Arthurs, A. F. Stacey, F. G. Nyall; Mount Bryan—E. K. Collins, J. Simpson, T. O'Connell, H. Collins; Saddleworth—R. Mullins, C. L. and C. E. Pellew, W. Coles, A. G. Bowers, L. A. Ridge.

## RIVER MURRAY HERD TESTING ASSOCIATION.

## RESULTS OF BUTTERFAT TESTS FOR MARCH, 1922.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.		
			Per Herd during March.	Per Cow during March.	Per Cow October to March.	Per Herd during March.	Per Cow during March.	Per Cow October to March.
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1/A	13	12-32	8,977	690-54	3,539-48	421-95	32-46	158-36
1/C	26-29	20-61	14,919	567-48	4,347-47	622-74	23-69	181-65
1/E	18	14-42	9,590	532-78	3,237-30	442-98	24-61	142-77
1/G	49-81	42-68	44,549	894-38	5,234-44	1,697-11	34-07	202-26
1/I	10-58	9-13	7,557-5	714-32	4,170-17	312-93	29-58	177-28
1/J	18	16-48	9,107	505-94	3,606-95	452-95	25-16	162-43
1/K	15	11	8,013-5	534-23	3,912-56	368-75	24-58	171-76
1/L	13	11-10	5,908-5	454-50	3,092-35	287-87	22-14	149-35
1/M	19-90	18-90	10,520	528-65	3,019-43	527-03	26-48	138-36
1/O	33-48	23-65	12,809-5	382-60	3,196-07	612-39	18-29	147-87
1/R	19	14-68	7,282	383-26	2,224-05	399-22	21-01	110-82
1/S	16	10-61	5,331-5	333-22	2,810-18	255-10	15-94	123-91
1/T	13	11-65	7,821-5	601-65	2,878-04	407-07	31-31	143-98
1/U	12-16	11-16	9,232-5	759-25	3,931-43	419-10	34-47	178-38
1/V	16	14-94	8,364	522-75	3,032-82	398-08	24-88	133-74
MEANS	19-55	16-22	11,332-17	579-71	3,672-24	508-35	26-01	159-66

**60% PHOSPHATES**

finely ground will greatly benefit your fruit trees or vines.

90s. per ton on trucks, Port Adelaide.

**"CRUSADER" MOTOR SPIRIT****QUICK STARTING. - FULL POWERED.****Arthur H. HASELL, PORT ADELAIDE,**  
MANUFACTURER and IMPORTER.

## ORCHARD NOTES FOR SOUTHERN DISTRICTS.

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[By C. H. BEAUMONT, Orchard Instructor and Inspector.]

Ploughing will be continued. Each ploughing should be varied in depth in order to avoid a hard pan. Disc implements are worthy of more trial in the orchard.

Pruning will be continued. Gather the cuttings into heaps as the work proceeds, because it is much easier and takes less time than if they are left for the weeds to grow amongst them. It is also easier for the collector to pick them up for the dray or the burner. A burner is preferable. Any diseased trees should be left until last.

Do not forget your olives. Make your own oil if the price is not satisfactory. Vines must be prepared for swabbing with sulphuric acid if anthracnose has been on them. It must be done before the vine shows any sign of activity. Growers of fruit for drying have been in trouble this year because of the early winter, except those who were fortunate enough to own evaporators, or dehydrators, as these driers are now called. They all should have a plant ready. Evaporated fruits look better and are better than those dried outside. Codlin moth bandages should be removed, and all loose bark scraped off, and broken ends cut clean. Rotten or dry parts should be cleaned out; also all the hollows; hollows may be filled up with ordinary lime or cement mortar. Woolly aphid continues to be a serious nuisance. It is but little understood, and is a remarkable little insect. It is similar to phylloxera, in that it can live in the roots as well as in the limbs, but its method of attack is altogether different. The host plant is the elm. The first insect is a very rare one, and is called the mother queen, which is either the hibernating form, living in winter in crevices or below ground, or is the adult from the eggs; it produces living young in spring and summer. Secondly, we have the unsexed wingless female, the adult product of the mother queen; it produces young continuously, being parthenogenetic, that is, able to continue fertility for several generations, without intervention of the male. Thirdly, we have the winged female, unsexed, which is produced from pupae irregularly in autumn. Fourthly, we have the very rare wingless egg-laying female. She is produced at long intervals in autumn, and lays one egg, and, dying, shelters the egg with her body, and exists above ground only. Fifthly, we have the wingless male, which is also very rare, and lives only above ground.

If the weather is suitable the aphid increases very fast, and is simply taken from one orchard to another by the birds or by careless pruning men. As many as 12 to 14 swarms have been observed during one summer. They group themselves in colonies on the branches, and prefer newly made wounds as a starting place. That is one reason why all big cuts should be painted. They attack the tree by sinking their darts through the bark and as far as the cambium. The activity of the sap in this part of the tree is soon increased, and this gives rise to the

abnormal tissue, or galls or nodosities. These lumps split deeply, and form a cancerous tissue, which causes the rot of the branch; it also makes crevices in which the insect can winter, and thus defeat to some extent our attempts to make the trees blight proof. On some old trees, hollows will be found the full length of the limb, and will be full of aphids. They will go into the ground as deep as 26 in. on roots which are not blight proof. This pest is world wide, and there are quite 100 remedies for curing it, but in all the "cures" it is admitted that continuous application is necessary. In a young orchard it is possible to prevent it getting a start by carefully watching for the least trace of it, and at once rubbing it thoroughly with a paint brush dipped in kerosine. For those orchards which are more or less badly affected the best treatment is spraying with tobacco wash, and the best tobacco wash is made by using "black leaf 40" and soap as directed. The spray nozzle must be a coarse one, and the spray must saturate the colonies of insects, and must be applied as often as the insects return to attack the trees. A high pressure is necessary to do effective work.

## **BAGOT'S**

**Executor and Trustee Company, Ltd.**

Offices: 22, King William Street, Adelaide.

### **A REMINDER TO PROPERTY OWNERS !**

Men spend their time and effort in acquiring property in order to achieve financial independence. To this end they engage their resources in business and other industries, or they seek safe and profitable investments. In all these activities they direct vigorous efforts towards the protection of their property. During their lives they endeavor to guard against every change which may lessen or damage their resources, but their plans for obtaining safety often fail to take into account the one thing which is sure to happen—the death of the planner. Many owners of property seldom consider how their property is to be managed after their death to support those for whom it is their duty to provide.

**HAVE YOU TAKEN STEPS SO THAT YOUR POSSESSIONS WILL  
BE ADEQUATELY PROTECTED AFTER YOUR DEATH ?**

**WRITE OR CALL FOR FREE BOOKLET.**

**WHEATEN HAY AND BARLEY STRAW FOR STOCK.**

An equal mixture of good wheaten hay and barley straw, although it be chaffed, is not a good ration, even for maintenance purposes, for horses or any other form of farm livestock, because of the large amount of dry matter which must be consumed for the animals to obtain sufficient digestible matter. On analysis, says the Superintendent of Experimental Work (Mr. W. J. Spafford), these substances show the following amount of digestible matter:—

	Digestible Protein.	Digestible Fat.	Digestible Fibre.	Digestible Carbo-hydrates.	Starch Equivalent.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Wheaten hay . . . . .	2.8	0.5	7.9	33.7	30.9
Barley straw . . . . .	0.9	0.5	21.3	19.0	19.0
Equal mixture of the two (approx.)	1.8	0.5	14.6	26.3	25.0

According to Kellner, a draught horse weighing 1,400lbs. (about the average weight of South Australian farm horses), while on light work, a cow weighing 1,000lbs. and practically dry, and a sheep on a maintenance diet, require per day:—

	Dry Matter. Lbs.	Digestible Protein. Lbs.	Starch Equivalent. Lbs.
Horse (1,400lbs.) on light work . . . . .	28	1.7	12.9
Cow (1,000lbs.) almost dry . . . . .	22	1.2	7.8
Sheep (120lbs.), maintenance ration . . . . .	2.4	0.14	1.0

If we take it that both the hay and the straw contain 10 per cent. moisture, then a glance at the above figures will show that, if we supply the amount of dry matter in the mixture necessary for a 1,400lb. horse on light work, i.e., 31lbs. per day, the animal will only receive 0.56lb. of digestible protein, and 7.75lbs. starch equivalent; if we give the horse enough of the mixture to make up 12.9lbs. of starch equivalent, it will take 51.6lbs. of the mixture; and as a horse requires 1.7lbs. of digestible protein per day, it will take nearly 100lbs. of the mixture to supply this, if absolutely no other foodstuffs are available.

The value of this mixture of hay and straw chaff is greater, of course, when used as a maintenance ration pure and simple; but even then, if the materials are of average composition, with few exceptions farm animals will lose condition if fed solely on it. The addition of some concentrated foodstuffs would make a very fair maintenance ration with this chaff as a basis, such as about 1lb. of oats or bran to every 2lbs. or 3lbs. of chaff.

We know by experience that such a mixture as suggested will keep farm livestock, providing that they are only fed with it for short periods of time; but unless very large amounts are given them, it practically always means a loss of condition.

## THE AGRICULTURAL OUTLOOK.

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*Booborowie.*—Weather—June, on the whole, has been comparatively mild, and the coldest spell prevailed towards the end of the month. The total rain registered up to the time of writing is 105 points, and 155 points short of the mean for June. Crops—These have germinated nicely, and have made but little growth, owing to the excessive coldness of the locality. Natural feed is plentiful for this period of the year. Stock—All in good, healthy condition, but stock living on the roads are poor. Pests—Rabbits are numerous in places, and thistles are to be seen in large numbers. Miscellaneous—Seeding is completed, and in some instances farmers are to be seen fallowing.

*Kybybolite.*—Weather has been good for the month, keeping comparatively fine and calm, until the last week of the month, when real winter conditions set in. Two hundred and sixty-eight points rain were registered, which is three-quarters of an inch less than the average for the month, and the total for the half-year is approximately 7 in., 2 in. less than the average. Several heavy frosts were noted during the month. Conditions for seeding cereals were good during the bulk of the month, and consequently more land has been put under crop than was at first anticipated. Crops generally have germinated well, and made really good early growth. Last year's spring-sown kale and turnips have made a wealth of growth. Natural feed has made very fair progress, and stock are mostly all in good condition. Pests—Cockatoos have been troubling the germinating crops considerably.

*Minnipa.*—Weather—Rough weather, with light showers, the rainfall being 110 points, which fell on 11 raining days. Crops have been badly in need of a decent rain, but rain just to hand has saved them. It is still raining, and shows prospects of quite a good downfall, which was very badly needed. There has been rather a disappointing germination in some crops. Natural feed—A little barley grass has come away quite well, but spear grass is hanging fire. Stock are all in good condition, and free from disease. Pests—Rabbits are putting in an appearance again, but they are being kept fairly well in hand. Miscellaneous—Have been waiting for decent rains, to commence fallowing, which we will be able to push on with now.

*Turretfield.*—Weather—The weather has been very seasonable, nice rains having fallen at beginning and end of month, giving 169 points of rain; a few very cold days were experienced. Crops—Nearly all farmers have finished seeding, and the early crops are looking very well; a larger area has been sown this year. Natural feed is growing nicely, but many farmers in this district work on a system of fallow crop, and so have no feed for stock. Stock is in fair condition, and the lambs are making nice growth. Pests—Mice and rats are becoming numerous. Miscellaneous—Fallowing has been started on some of the farms.

*Veitch.*—Weather conditions have been very seasonable, 84 points of rain for the month having been received up to date. Average for June at Veitch, 147 points. Have experienced very mild weather, with absence of frost and wind. Crops are making splendid growth; those seeded very early are a little bit rank, but showing a good healthy color. Any amount of natural feed now available for livestock, but is mostly barley grass, and will not stand long for feeding. All stock are in healthy condition. Pests—Rabbits are leaving a mark on the crops, and require attention. Miscellaneous—Consignments of wood are now being forwarded from this district.

## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, reported on July 1st, 1922:—

**BUTTER.**—Further rains were recorded during June, which made the season assured to those interested in the dairying industry. Increasing quantities of both cream and butter have come along, and already there is a surplus being exported to London at very remunerative prices. The season could not look more favorable, and markets in Great Britain are sure to be good throughout, as there will be no carry-over of stocks from last year. At the close of the month first grade to choicest factory and creamery butter, fresh, in bulk, sold from 1s. 7d. to 1s. 7½d.; best private separators and dairies, 1s. 6d. to 1s. 7d.; fair quality, 1s. 4d. to 1s. 5d.; store and collectors', 1s. 2d. to 1s. 3d.

**EGGS** showed a seasonable increase, and values came back accordingly. As some of the pastrycooks have exhausted their supplies of egg pulp, they are now operating on the market, and good clearances are being effected. Values ruling at close of period were 1s. 7d. per dozen for fresh hen; 1s. 8d. duck.

**CHEESE.**—Values have shown a slight easing, owing to the anxiety of some holders to quit their cold stored lots. However, as London is likely to be a buyer shortly, this should steady rates. Present range is from 8d. to 9d. for large to loaf.

**HONEY** continues to come forward in fair quantities, and where quality is prime nice clearances have been effected at 3½d. to 4d. for prime clear extracted; second grades continue slow of sale at 2d. to 2½d. Beeswax wanted at 1s. 9d. for clear samples.

**ALMONDS.**—Stocks are light, and values have hardened, all consignments meeting with ready quitance. Brandis sold, at end of month, at 1s. 1d.; mixed soft-shells, 1s.; hardshells, 5½d. to 6d.; kernels, 2s.

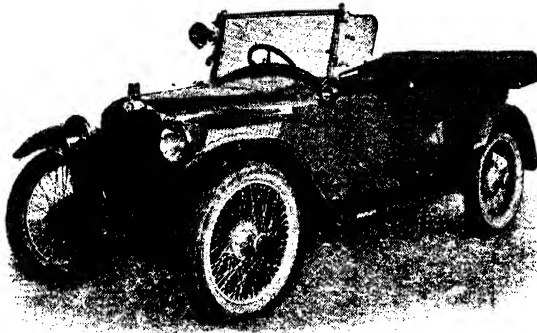
**BACON.**—Values throughout month have kept very stationary, quantities coming forward being equal to trade requirements. Best factory cured sides sold at 11½d. to 1s.; middles, 1s. 1d. to 1s. 2d.; hams slow at 1s. 1d. to 1s. 1½d. Lard in packets, 8d.; bulk, 7½d.

**LIVE POULTRY.**—Supplies have kept up remarkably well, and the pleasing feature is the active demand that has ruled throughout the month. Heavy catalogues have been submitted on Tuesdays, Thursdays, and Fridays, and in every instance market has been cleared. Prices realised should be satisfactory to consignors. Crates obtainable on application. At end of month rates were:—Prime roosters, 4s. to 5s. 9d.; nice-conditioned cockerels, 3s. to 3s. 11d.; plump hens, 3s. 6d. to 4s. 9d.; medium hens, 2s. 3d. to 3s. 3d.; couple pens weedy sorts lower; ducks, prime conditioned, 4s. to 5s. 6d.; fair conditioned, 2s. 6d. to 3s. 9d.; geese, 5s. 6d. to 6s. 6d.; turkeys, prime quality, 10½d. to 1s. 2d. per lb. live weight; fair quality, 8d. to 10d. per lb.; pigeons, 5½d. to 8d.

**POTATOES.**—Market in Victoria has firmed in price during the latter end of the month, owing, no doubt, to the rains having prevented ready digging, and supplies marketed were a bit short. Millicent potatoes of good quality, we are advised, are now just about finished. Quotations at end of month were:—Millicent Red-skins, £3 7s. 6d. to £3 12s. 6d.; Snowflakes, £3 15s. to £4 5s. per ton, on trucks, Millicent; Victorian Carmens, £7 10s. to £8 10s. per ton, on trucks, Mile End.

**ONIONS.**—There has been a sharp rise in these, and market is somewhat bare. Values at end of month were from £11 to £12 per ton, on trucks, Mile End.





**F**ACTORY records show that 50 per cent. of Hupmobile sales are made to people who have driven Hupmobiles before. To our mind there can be no stronger testimonial as to the service the car actually yields—its unusual economy and its extraordinary performance.

SOLE AGENTS—

**PHOENIX MOTOR CO., LTD.,**

112-120, PIRIE STREET, ADELAIDE.

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# Hupmobile

## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of June, 1922, also the average precipitation to the end of June, and the average annual rainfall.

Station.	For June, 1922.	To end June, 1922.	Average to end June, 1922.	Average Annual Rainfall	Station.	For June, 1922.	To end June, 1922.	Average to end June, 1922.	Average Annual Rainfall
FAR NORTH AND UPPER NORTH.					LOWER NORTH—continued.				
Oodnadatta.....	0.35	3.65	2.91	4.83	Spalding .....	1.38	8.44	8.43	20.33
Marree .....	0.02	1.82	3.36	6.10	Gulnare .....	1.47	9.43	8.01	19.23
Farina .....	—	2.52	3.85	6.73	Yacka .....	1.19	6.95	6.87	15.34
Copley .....	0.08	2.15	4.78	8.45	Koolunga .....	1.20	7.00	6.98	15.79
Beltana .....	0.21	3.13	4.91	9.01	Snowtown .....	1.13	7.17	7.47	15.95
Blinman .....	0.56	3.70	6.62	12.62	Brinkworth .....	1.08	6.46	7.09	16.16
Tarcoola .....	0.36	1.83	2.44	7.59	Blyth .....	2.33	7.88	7.86	16.75
Hookina .....	0.54	7.53	6.54	13.30	Clare .....	3.40	12.27	11.01	24.51
Hawker .....	0.53	7.59	6.15	12.72	Mintaro .....	3.73	12.94	9.97	23.26
Wilson .....	0.50	6.56	6.05	12.33	Watervale .....	3.71	13.99	12.27	27.41
Gordon .....	0.33	5.33	5.53	11.05	Auburn .....	2.63	11.72	10.89	24.25
Quorn .....	0.55	5.24	6.49	14.00	Hoyleton .....	1.69	8.13	8.10	17.79
Port Augusta .....	0.42	5.44	4.89	9.54	Balaklava .....	1.98	7.30	7.42	15.87
Port Augusta West .....	0.32	5.21	4.62	9.53	Port Wakefield .....	1.69	5.54	6.71	13.19
Bruce .....	0.67	5.17	4.96	10.40	Terowie .....	0.85	7.02	6.02	13.67
Hammond .....	1.06	5.93	5.54	11.61	Yarcowie .....	0.62	9.92	6.34	14.06
Wilmington .....	1.17	8.55	8.39	18.17	Hallett .....	1.10	6.22	6.99	16.37
Willowie .....	1.00	7.67	5.65	12.16	Mount Bryan .....	1.04	8.15	6.90	16.54
Melrose .....	2.50	12.68	10.87	23.21	Koorina .....	1.51	9.37	8.02	17.96
Booleroo Centre .....	1.83	8.02	7.11	15.53	Farrell's Flat .....	1.57	8.61	8.43	18.90
Port Germein .....	1.11	6.71	6.18	12.79					
Wirrabara .....	1.23	7.42	8.83	19.62	WEST OF MURRAY RANGE.				
Appila .....	0.90	6.09	7.77	14.98	Manoora .....	2.83	10.69	6.04	18.63
Cradock .....	0.56	7.08	5.52	11.18	Saddleworth .....	1.71	9.72	8.96	19.70
Carrieton .....	0.93	6.26	5.89	12.63	Marrabel .....	2.60	10.89	8.46	19.55
Johnburg .....	0.81	7.20	5.92	10.50	Riverton .....	2.35	10.64	9.38	20.66
Eurelia .....	1.12	6.32	6.09	13.36	Tarlee .....	2.47	9.37	8.06	17.75
Orroroo .....	1.20	6.76	6.52	13.57	Stockport .....	2.69	9.27	7.28	16.34
Nackara .....	1.17	8.50	5.85	11.33	Hamley Bridge .....	2.24	8.53	7.57	16.45
Black Rock .....	0.91	6.27	5.95	12.51	Kapunda .....	2.08	8.51	8.96	19.80
Ucolta .....	0.52	4.81	5.55	11.90	Freeling .....	1.74	8.92	8.04	17.82
Peterborough .....	0.88	6.01	7.55	13.43	Greenock .....	1.83	9.97	9.46	21.56
Yongala .....	1.19	6.45	6.44	14.41	Truro .....	2.35	9.26	8.89	20.07
					Stockwell .....	1.74	9.07	8.99	20.24
LOWER NORTH-EAST.					Nuriotpa .....	1.74	9.39	9.29	20.94
Yunta .....	0.21	2.80	4.59	8.75	Angaston .....	1.74	11.23	9.94	22.44
Waukaringa .....	0.55	2.54	4.30	8.41	Tanunda .....	1.64	10.86	10.15	22.17
Mannahill .....	0.35	1.54	4.39	8.54	Lyndoch .....	2.35	11.13	10.10	22.81
Cockburn .....	0.35	2.59	5.12	8.22	Williamstown .....	2.59	11.72	12.56	27.52
Broken Hill, N.S.W. .....	0.70	3.67	—	9.91					
LOWER NORTH.					ADELAIDE PLAINS.				
Port Pirie .....	1.48	7.83	6.56	13.36	Mallala .....	1.64	7.08	7.83	16.58
Port Broughton .....	1.75	7.91	6.82	14.18	Roseworthy .....	1.73	7.35	7.96	17.27
Bute .....	1.48	6.88	7.25	15.65	Gawler .....	1.46	7.47	8.96	19.08
Laura .....	1.56	9.82	8.06	18.16	Two Wells .....	1.55	6.26	7.69	15.85
Caltowie .....	1.19	9.08	7.50	17.07	Virginia .....	1.87	6.68	8.27	17.32
Jamestown .....	1.43	9.25	7.61	17.74	Smithfield .....	1.56	6.89	8.05	17.15
Bundaleer W. Wks. .....	1.77	9.00	7.51	17.89	Salisbury .....	1.61	8.41	8.89	18.49
Gladstone .....	1.64	10.03	7.07	16.13	North Adelaide .....	2.04	11.03	10.44	22.09
Crystal Brook .....	1.58	8.83	7.29	15.74	Adelaide .....	2.80	10.06	10.04	21.03
Georgetown .....	1.63	11.03	8.30	18.44	Glenelg .....	2.89	9.43	8.95	18.37
Narridy .....	0.83	6.94	7.54	16.41	Brighton .....	2.91	10.00	9.56	21.24
Redhill .....	1.39	7.53	7.77	16.75	Mitcham .....	3.82	15.74	11.40	23.92
					Glen Osmond .....	3.60	14.93	12.25	25.74
					Magill .....	3.28	13.38	12.13	25.27

## RAINFALL—continued.

Station.	For June, 1922.	To end June, 1922.	Av'ge. to end June, 1922.	Av'ge. Annual Rainfall	Station.	For June, 1922.	To end June, 1922.	Av'ge. to end June, 1922.	Av'ge. Annual Rainfall
MOUNT LOFTY RANGES.					WEST OF SPENCER'S GULF—continued.				
Teatree Gully .....	2-19	10-85	14-14	27-77	Port Lincoln .....	3-20	7-84	9-09	19-75
Stirling West .....	6-30	25-71	20-61	46-62	Tumby .....	1-71	4-52	6-08	14-62
Uraidla .....	6-11	24-12	20-54	44-06	Carrow .....	1-24	3-96	5-93	14-64
Clarendon .....	4-73	17-87	15-51	32-98	Arno Bay .....	0-82	3-14	5-90	13-08
Morphett Vale .....	3-49	11-82	10-73	22-76	Cowell .....	1-52	2-98	4-73	11-52
Noarlunga .....	2-76	8-58	9-64	20-27	Minnipa .....	1-16	3-98	—	—
Willunga .....	4-52	14-76	12-11	25-87					
Aldinga .....	3-14	11-31	8-71	20-24	YORKE PENINSULA.				
Myponga .....	5-32	15-32	13-38	28-44	Walleroo .....	1-83	6-01	7-15	14-09
Normanville .....	5-32	12-57	9-81	20-51	Kadina .....	1-69	6-74	7-89	15-93
Yankalilla .....	6-06	15-15	11-25	22-99	Moonta .....	1-82	6-26	7-71	15-25
Mount Pleasant .....	4-02	14-52	12-32	27-04	Green's Plains .....	1-85	6-60	7-39	15-72
Birdwood .....	2-83	12-74	13-02	29-26	Maitland .....	1-87	8-10	9-57	20-05
Gumeracha .....	3-13	14-54	15-10	33-25	Ardrossan .....	2-44	6-75	6-78	13-95
Millbrook Reservoir .....	3-79	16-14	—	—	Port Victoria .....	1-57	7-11	7-53	15-35
Tweedvale .....	4-10	14-41	15-75	35-54	Curramulka .....	1-50	7-10	8-39	18-16
Woodside .....	3-97	16-38	14-13	32-08	Minlaton .....	1-55	7-89	8-91	17-79
Ambleside .....	4-12	17-43	15-16	34-62	Brentwood .....	1-86	6-90	7-24	15-54
Nairne .....	3-63	12-02	12-74	28-43	Stansbury .....	1-56	7-09	7-88	16-96
Mount Barker .....	4-03	16-08	13-80	31-13	Warooka .....	2-99	9-23	8-13	17-69
Echunga .....	4-84	15-82	15-25	32-91	Yorketown .....	2-32	7-30	7-99	17-22
Macclesfield .....	4-88	13-78	13-38	30-53	Edithburgh .....	1-70	7-06	7-79	16-53
Meadows .....	5-64	17-19	16-19	36-04					
Strathalbyn .....	2-65	7-84	8-76	19-26	SOUTH AND SOUTH-EAST.				
MURRAY FLATS AND VALLEY.					Cape Borda .....	3-56	10-85	12-02	25-01
Meningie .....	3-35	10-03	8-61	18-66	Kingscote .....	2-14	6-94	9-00	19-01
Milang .....	2-59	7-45	7-32	15-42	Penneshaw .....	3-00	8-41	8-11	18-97
Langhorne's Bridge .....	2-42	7-99	6-56	14-55	Victor Harbor .....	4-11	10-86	9-95	21-43
Wellington .....	2-24	7-19	6-79	14-68	Port Elliot .....	4-16	10-25	9-30	20-00
Tailen Bend .....	2-18	6-71	6-44	14-11	Goolwa .....	2-30	7-47	8-34	17-83
Murray Bridge .....	1-83	6-06	6-48	13-83	Meribah .....	1-99	6-98	—	—
Callington .....	2-63	6-72	7-15	15-37	Mindarie .....	1-38	4-88	—	—
Mannum .....	1-38	5-60	5-66	11-52	Karoonda .....	1-92	7-21	—	—
Palmer .....	1-66	5-70	6-49	15-24	Pinnaroo .....	1-60	6-05	6-89	15-32
Sedan .....	0-92	5-30	5-74	12-13	Parilla .....	1-37	6-43	6-20	14-39
Swan Reach .....	1-09	5-49	4-95	10-82	Lameroo .....	1-49	7-03	7-01	16-27
Blanchetown .....	0-45	3-27	4-95	10-16	Parrakie .....	1-39	6-08	6-05	14-27
Eudunda .....	1-40	8-10	7-73	17-50	Geranium .....	2-64	9-04	6-75	15-96
Sutherlands .....	1-01	6-03	4-85	10-92	Peake .....	2-22	7-94	6-00	15-91
Morgan .....	0-41	4-76	4-27	9-18	Cooke's Plains .....	2-51	8-45	6-68	14-84
Waikerie .....	0-70	4-39	4-40	9-68	Coomandook .....	2-58	8-71	7-58	17-31
Overland Corner .....	0-64	4-77	5-22	11-08	Coonalpyn .....	1-82	8-00	7-67	17-44
Loxton .....	0-96	6-39	5-58	12-58	Tintinara .....	2-08	9-03	7-99	18-54
Renmark .....	0-72	5-91	4-89	11-02	Keith .....	2-05	9-15	7-68	18-19
WEST OF SPENCER'S GULF.					Bordertown .....	2-39	6-80	8-55	19-44
Eucla .....	1-67	5-96	5-54	10-02	Wolsley .....	2-53	6-58	7-86	18-06
White Well .....	1-71	7-23	4-39	9-10	Frances .....	1-79	7-31	—	19-78
Fowler's Bay .....	2-09	5-67	6-26	12-19	Naracoorte .....	3-17	8-63	9-93	22-46
Penong .....	1-58	6-43	6-20	12-25	Penola .....	3-32	9-54	11-59	26-36
Ceduna .....	0-81	3-53	4-75	10-32	Lucindale .....	3-91	11-32	10-10	22-91
Smoky Bay .....	1-98	5-58	5-42	10-92	Kingston .....	2-95	13-31	11-36	24-44
Petina .....	1-72	5-92	5-78	13-05	Robe .....	6-24	14-66	11-34	24-58
Streaky Bay .....	2-89	6-74	7-15	15-11	Beachport .....	4-14	13-12	12-86	27-27
Talia .....	2-35	5-89	6-31	15-38	Millicent .....	3-61	13-48	13-72	29-37
Port Elliot .....	3-49	8-21	7-81	16-53	Kalangadoo .....	3-35	12-91	—	—
Cummins .....	2-88	7-25	—	18-87	Mount Gambier .....	3-57	11-49	13-86	31-46

## AGRICULTURAL BUREAU REPORTS.

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Alawoona .....	*	—	—	Freeling .....	*	—	—
Aldinga .....	*	—	—	Gawler River .....	1076	10	7
Amyton .....	1070	—	—	Georgetown .....	*	8	5
Angaston .....	*	—	—	Geranium .....	*	29	26
Appila-Yarrowie .....	*	—	—	Gladstone .....	1072	8	4
Arthurton .....	*	—	—	Glencoe .....	*	12	—
Ashbourne .....	*	—	—	Glossop .....	*	—	—
Balaklava .....	*	8	12	Goode .....	1091	—	9
Balhannah .....	1100	7	4	Green Patch .....	*	3	7
Barmera .....	†	4	8	Gumeracha .....	*	10	7
Beetaloo Valley .....	1071	3	7	Halidon .....	*	—	—
Belalie North .....	*	8	5	Hartley .....	*	5	11
Berri .....	†	12	9	Hawker .....	*	11	8
Big Swamp .....	*	—	—	Hillbown .....	*	—	—
Blackheath .....	†	8	5	Hookina .....	1071	6	3
Black Springs .....	1076	11	8	Inman Valley .....	*	—	—
Blackwood .....	1100	17	21	Ironbank .....	1101	8	5
Block E .....	1075	—	—	Julia .....	*	—	—
Blyth .....	†	1	5	Kadina .....	*	—	—
Booloroo Centre .....	1071	7	4	Kalangadoo .....	1107	8	12
Borrika .....	*	—	—	Kangarilla .....	1098	7	4
Bowhill .....	*	—	—	Kanmantoo .....	*	8	5
Brentwood .....	1086	6	3	Keith .....	*	—	—
Brinkley .....	*	8	5	Ki Ki .....	*	—	—
Bundaleer Springs .....	*	—	7	Kilkerran .....	*	6	3
Burra .....	*	—	—	Kimba .....	*	—	—
Bute .....	*	4	8	Kingscote .....	*	—	—
Butler .....	1088	10	3	Kingston-on-Murray .....	*	—	—
Cadell .....	*	—	—	Kongorong .....	*	6	3
Caltowie .....	*	—	—	Koonibba .....	1094	7	4
Canowie Belt .....	*	—	—	Koppio .....	1094	3	7
Carrow .....	*	6	3	Kybybolite .....	†	6	3
Cherry Gardens .....	†	4	8	Lake Wangary .....	1094	8	5
Clanfield .....	*	—	—	Lameroo .....	*	7	4
Clare .....	*	7	—	Laura .....	1072	8	5
Clarendon .....	1098	3	7	Leighton .....	*	—	—
Claypan Bore .....	*	12	9	Lenswood and Forest Range .....	*	22	26
Cleve .....	*	5	2	Lone Gum .....	1097	5	2
Collie .....	1089	—	—	Lone Pine .....	1077	—	—
Colton .....	1090	28	25	Longwood .....	1101	8	12
Coomandook .....	1097	—	2	Loxton .....	*	—	—
Coonalpyn .....	†	7	11	Lucindale .....	*	—	—
Coonawarra .....	*	—	—	Lyndoch .....	1084	6	3
Coorabie .....	†	—	—	MacGillivray .....	*	5	3
Craddock .....	*	—	—	McLachlan .....	*	8	—
Crystal Brook .....	*	8	5	Maitland .....	1088	6	—
Cygnat River .....	*	6	3	Mallala .....	†	3	7
Dawson .....	*	—	—	Maltee .....	1094	7	4
Denial Bay .....	*	—	—	Mangalo .....	*	—	—
Dowlingville .....	*	—	—	Meadows .....	*	5	2
Edillilie .....	*	29	26	Meningie .....	*	—	—
Elbow Hill .....	1090	15	8	Meribah .....	*	5	2
Eurelia .....	1070	14	11	Milang .....	†	8	12
Frances .....	1107	29	26				

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		July.	Aug.			July.	Aug.
Millicent .....	*	1	5	Riverton (Women's) ..	*	—	—
Miltalie .....	*	8	5	Roberts and Verran ..	1092	6	3
Mindarie .....	*	3	7	Rockwood .....	1102	10	7
Minlaton .....	*	7	4	Rosedale .....	1080-84	—	—
Minnipa .....	*	5	2	Rosy Pine .....	*	—	—
Mintaro .....	1073	8	5	Saddleworth .....	1085	—	—
Monarto South .....	1094	8	—	S a d d l e w o r t h	1084	—	—
Moonta .....	*	6	4	(Women's) .....		4	—
Moorak .....	1102-07	6	4	Salisbury .....	1085	—	1
Moorlands .....	*	—	—	Salt Creek .....	*	—	—
Moorook .....	*	—	—	Sandalwood .....	†	—	—
Morchard .....	1071	8	5	Second Vailey .....	†	—	—
Morgan .....	*	—	—	Shoal Bay .....	*	—	—
Morphett Vale .....	1101	6	10	Smoky Bay .....	†	—	—
Mount Barker .....	*	5	2	Spalding .....	*	—	—
Mount Bryan .....	1076	—	—	Stockport .....	*	—	—
Mount Byran East ..	*	—	—	Streaky Bay .....	1094	—	—
Mount Compass .....	*	—	—	Strathalbyn .....	*	4	8
Mount Gambier .....	1104	8	12	Talia .....	†	10	7
Mount Hope .....	1092	8	12	Tantanoola .....	†	8	5
Mount Pleasant .....	*	—	—	Taplan .....	*	15	12
Mount Remarkable ..	†	—	—	Tarcowie .....	†	4	8
Mundalla .....	1106	5	2	Tarlee .....	1082	—	—
Murray Bridge .....	*	18	15	Tatiara .....	1107	15	19
Mypolonga .....	*	5	2	Two Wells .....	1084	—	—
Myponga .....	*	—	—	Uraidla & Summertown	*	3	7
Nantawarra .....	1077-8	6	3	Veitch .....	*	—	—
Naracoorte .....	*	8	12	Virginia .....	*	—	—
Narridy .....	1076	8	12	Waikerie .....	*	—	—
Narrung .....	*	8	12	Wall .....	*	—	—
Neeta .....	*	—	—	Wanbi .....	*	—	—
Netherton .....	*	—	—	Warcowie .....	1071	—	—
North Booborowie ..	1074	—	—	Watervale .....	1085	—	—
North Bundaleer .....	*	—	—	Weavers .....	1088	3	7
Northfield .....	*	12	9	Whyte-Yarcowie .....	*	—	—
Nunkeri and Yurgo ..	*	2	6	Wilkawatt .....	1098	8	5
O'Loughlin .....	*	5	2	W i l l i a m s t o w n	1084	5	12
Orroroo .....	†	—	—	(Women's) .....		—	—
Owen .....	1078	14	—	Williamstown .....	1085	7	4
Parilla .....	*	—	—	Willowie .....	1071	5	2
Parilla Well .....	1097-8	10	7	Wilmington .....	*	5	2
Parrakie .....	*	—	—	Windsor .....	*	—	—
Paruna .....	*	—	—	Winkie .....	1098	3	—
Paskeville .....	†	4	8	Wirrabara .....	*	—	—
Penola .....	1107	1	5	Wirrega .....	*	—	—
Petina .....	1094	29	26	Wolowa .....	*	—	—
Pinnaroo .....	*	7	11	Wudinna .....	1094	—	—
Pompoota .....	*	—	—	Wynarka .....	*	—	—
Port Broughton .....	*	7	4	Yabmana .....	*	—	—
Port Elliot .....	*	15	19	Yacka .....	1075	4	8
Port Germein .....	*	15	12	Yadnarie .....	1093	4	1
Pygery .....	1094	—	—	Yallunda .....	*	—	—
Ramco .....	1094	3	7	Yaninee .....	*	—	—
Rapid Bay .....	1099	1	5	Yeelanna .....	1093	8	5
Redhill .....	1076	11	—	Yongala Vale .....	*	—	—
Rendelsham .....	1107	5	2	Yorketown .....	*	—	—
Renmark .....	*	—	—	Younghusband .....	*	—	10
Riverton .....	*	—	—				

\* No report received during the month of March.

† Held over until next month.

† Annual report only received.

## THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

##### (PETERBOROUGH AND NORTHWARD.)

AMYTON (Average annual rainfall, 11.82in.).

February 2nd.—Present: six members.

A paper from the *Journal of Agriculture*, "How to Destroy Rabbits," was read by a member, and an interesting discussion ensued.

SEEDING.—At a further meeting held on May 15th, Mr. A. Crisp read a paper dealing with the above subject. The speaker said he would take as an illustration a farm containing from 1,200 to 1,500 acres to form the subject of his remarks. On a farm of that area 350 to 400 acres should be cropped every year, 250 acres of which should be fallowed land. Fallowing should be commenced early in the season, and the work completed not later than the end of August. On well-worked fallow, on which rain had fallen during the preceding summer, drilling with wheat at the rate of 45lbs. of seed and 35lbs. of super should be commenced at the end of March. Under average conditions he thought it advisable to sow late or mid-season wheats—preferably Federation or Queen Fan—early in the season. If the seed was free from smut and sown under dry conditions, he did not advise pickling. If the seed was smutty, a solution of 1½lbs. of bluestone to 10galls. of water should be mixed with the grain on a cement floor. If stubble land was to be brought under crop, tillage should not be commenced until after rain had fallen, when the land should be cultivated and harrowed to induce a good germination of weed seeds. When there was a good showing of weeds, the paddock should again be cultivated and harrowed before the drill. Stubble land should be sown with an early wheat, such as Bearded Gluyas. He maintained that it was a big undertaking for one man to successfully work more than 300 acres of fallow, because, in addition to putting in the stubble, there would be the sheep, cows, and pigs to attend to.

##### EURELIA.

June 13th.—Present: nine members and four visitors.

DESTRUCTION OF FOXES.—In the course of a short paper dealing with this subject the Hon. Secretary (Mr. E. P. Wall) considered that the fox was one of the worst pests in Eurelia and the surrounding districts. A few years ago it was a rare sight to see a fox, but at the present time they were very numerous. He was of the opinion that landholders did not take sufficient precautions to keep the foxes under control. Five hundred lambs, which was a low estimate, were lost every year through the ravages of the foxes, and unless united action was taken, that number would be greatly increased. A simple method of laying poison was to drag a trail in different parts of the paddocks and along creeks, then lay the baits along the trail and cover them lightly with clay. Pieces of meat, fat, and liver were also suitable for making baits. After the poison had been inserted in the bait it was a good plan to put the meat over a fire. By doing that the fox would not detect the smell of the person preparing the baits. A lengthy discussion followed, in which all members were of the opinion that the use of poisoned baits

was the best method of destroying foxes. Several members stated that liver was the best for baits, as the fox took it readily, while other members stated, if baits were made out of small birds, there would be no danger of valuable dogs taking the poison.

**MORCHARD, June 10th.**—Several subjects of local interest, including the forthcoming Conference of Upper Northern Branches, to be held at Orroroo on August 3rd, were brought before the meeting, and an interesting discussion followed.

**HOKKINA, June 8th.**—Mr. S. Stone read an article, "Wheat Pickling," and in the discussion that followed it was agreed that whatever method was adopted, the most important point was to see that the work was done thoroughly. The subjects, "Wheat Most Subject to Smut" and "Varieties of Wheat Best Suited to the District," were also brought forward for discussion.

**WARCOWIE, June 7th.**—Mr. E. Jarvis read a paper, "Vermin Destruction," and it was resolved to ask the Government to enforce the destruction of rabbits on certain holdings in the district.

**WILLOWIE, June 8th.**—Mr. F. Bull delivered an address, "Do Cows and Pigs Pay as a Side Line on the Farm?" and an interesting discussion followed.

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## MIDDLE-NORTH DISTRICT.

### (PETERBOROUGH TO FARRELL'S FLAT.)

**BEETALOO VALLEY** (Average annual rainfall, 23.50in.).

June 12th.—Present: 13 members and two visitors.

**CARE OF FARM IMPLEMENTS.**—Mr. C. C. Cox, who contributed a paper on this subject, said the erection of good sheds, either of straw, stone, or galvanized iron, for the storage of implements and machinery when not in use, was most necessary on every farm. When seeding operations were completed the drill should be examined and any worn parts replaced. The oil holes and manure feeds should be cleaned out and all nuts and bolts screwed up tightly. After harvest the binder should be overhauled and the canvasses examined to see if they required new straps or buckles. The elevators should be rolled up and placed in a safe place away from mice and rats. The harvesters and strippers should be properly cleaned and repaired, the belts taken off and oiled, rolled up, and put away for next season. Wagons, trolleys, and tip-drays should be greased after every 50 miles, and the woodwork painted every three seasons. When not in use they should be kept in the shed and not left in the yard exposed to the weather. Cultivating implements did not require so much attention, but in order to do good work with the plough it should be properly set. It was a good plan, after the implement was set, to mark the furrows, so that should any part work loose, it could be re-adjusted without very much trouble. All axles and wheels should be kept in good order and given plenty of suitable grease or oil. All swings should be kept off the ground when not in use, and the implements painted every four years. The high prices charged for farm implements and machinery should make the farmer more careful with them. With the exercise of a little care in selecting a good grade of lubricants suitable for the different machines, and by the application of a little paint at intervals, the life of the machines would be considerably lengthened. The election of officers for the forthcoming year then took place.

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**BOOLEROO CENTRE** (Average annual rainfall, 15.83in.).

June 9th.—Present: 14 members and visitors.

**HOW TO MAKE FARM LIFE MORE ATTRACTIVE.**—Mr. J. Michael, who read a paper dealing with this subject, said the fact that a large majority of the population of the State resided in and around the city was clearly shown by the last census, when

it was stated that 62 per cent. of the people were congregated in the city and suburban areas. Such a state of things was to be deplored when one took into consideration the fact that South Australia was almost wholly a primary producing country. He believed that the main attractions of city life were the facilities that the people were afforded for enjoying themselves. That to a certain extent was to be expected, for it was only natural that a person would look for some means of recreation and enjoyment during his leisure hours. Another attraction was the modern conveniences of home life that helped to make living more comfortable, and if they desired to make rural life appeal to the masses, the people in the country should endeavor to keep pace with the city in respect to those improvements. He was of the opinion that if the farmer were to spend more money on the home, instead of acquiring more land, as was often the case, the people in the city would be more favorably impressed with country life. The city homes, besides having an attractive appearance, were supplied with many conveniences to lighten the labors of the women folk. In many cases at the present time the lot of the women on the farms was a hard one, yet the arduous labors would be considerably lightened by the installation of labor-saving devices. Every encouragement should be given to the young people to participate in sports and social gatherings. The hired man on the farm should also receive better consideration and treatment, and be paid a fair wage for his work. Lack of water was also another obstacle, and wherever possible methods of conservation should be introduced. A plot of land set aside for a farm garden would not only be the means of supplying the household with fresh fruit and vegetables, but it would add very considerably to the appearance of the holding. An interesting discussion followed.

#### GLADSTONE (Average annual rainfall, 16in.).

May 6th.—Present: eight members and one visitor.

**HOW TO MAKE THE WORKING OF BRANCHES MORE ATTRACTIVE.**—The chairman (Mr. C. O. Bennett) delivered a short address on this subject. He said the Bureau should hold combined meetings, and should broaden their meetings by having either fireside or social gatherings. Lectures should be given that would attract all members of the community. He believed that success rested in no small way on the social work of the Branch, and by that means they could do good propaganda work. Mr. Hollitt endorsed the views of Mr. Bennett. The interchange of ideas with Branches would stimulate interest and induce others to join. Mr. J. Sargeant was in favor of holding homestead meetings once or twice a year, and also in experimental plots of three or four acres.

#### LAURA.

May 13th.—Present: 10 members.

**BEST FRUITS FOR THE DISTRICT.**—Mr. H. R. Hammill read the following paper:—  
 "In planting an orchard I would advise the person about to plant to take as much trouble as possible to find out suitable varieties of different fruits to plant, as it is very easy to get varieties that do not suit the district. Our district in general is not well suited to the apples, but they can be grown well in selected spots. Cleopatra being the best all-round variety to grow. The only fault it has is that in wet seasons it is more susceptible to disease than most varieties. The Ben Davis is a good cropper, and will always demand a good price because of its excellent color. The Black Ben Davis is another very fine variety. For an early dessert apple I recommend the King David. Other varieties that are well worth a place in the orchard are Emperor Alexander for cooking and Kentucky Red Streak and Garibaldi. I consider the Duchess the best all-round pear for this district, being good for both dessert and cooking. The Howell is another good sort, but requires hard pruning to get the best results. For a late pear I suggest Keiffer's Hybrid, but this variety should not be pruned heavily. The Vicar of Winkfield is also well worth a place. Apricots are well suited to our district. For early results I like Newcastle Early, next Cullin's Early, and finally the Moorpark for late cropping and drying. Lee's Seedling is a good early nectarine, but for the best all-round variety I recommend Goldmine. As regards peaches, I think High's Canada Early is the best sort for our district, while Wiggins' Triumph and Hales' Early are well worth planting. For mid-season I place Elberta, Peregrine, and Lowe's Grognet as the best three. Camden Golden, Finlayson's

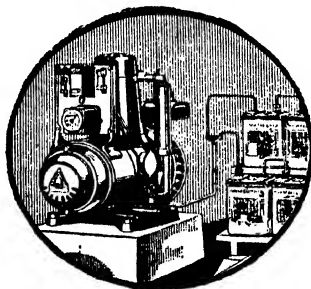


Seedling, and Late Italian Red are recommended for late planting. Plums do as well in our district as any other fruit, and I favor the Japanese varieties in the following order:—October Purple, Satsuma Blood, Rubio, Burbank, and Shipper. Other sorts of the ordinary plums worthy of space are Early Orleans and Egg plums. Oranges are well suited to our district where a well-sheltered and good piece of land can be secured. I would recommend planting 50 per cent. of Washington Navels, if the land is good; but should the land be of a poorer nature, I would plant mainly ordinary sorts. Thompson Improved Navel and Navelenica are also good varieties of the navel orange. Of common oranges, Michael is the best; then running very close, Mediterranean Sweets, Parramatta, Sabina, and Valencia Late."

#### MINTARO.

June 10th.—Present: five members.

**How TO BENEFIT THE DISTRICT.**—In the course of a short paper under the heading, "In What Way Can a Farmer in this District Best Further the Interests of the Community," Mr. S. Schunke was of the opinion that the farmer should expend more time towards the improvement of the stock, in order to stimulate a keener interest in the work of the farm. Experiments with different varieties of wheat, dressings of super., and methods of working the land would also help in arousing a healthy competition among neighboring farmers. Such experiments



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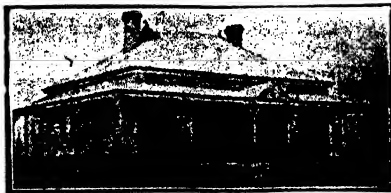
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would mean that a deeper interest would be taken in all agricultural operations. A paper under the same title was also read by Mr. A. Hall, in which the speaker contended that fallowing was the most important work on the farm. Fallowing should be performed with a stump-jump plough, each share cutting an 8in. strip of land. On black land he considered a depth of 6in. to be the best, and on red land he recommended working the land to a depth of 4in. Early fallow was undoubtedly the best, but the fallow should not be worked whilst in a dry condition, if such a practice could be avoided. The high price for agricultural implements should make the farmer take greater care of his machines, for neglect of them would very considerably reduce any profits that might accrue from the year's work. Sheds should be erected, and the machines kept under cover when not in use. Broken and worn-out parts should be recorded, and an order placed for new parts, so that no time would be lost when the machines were required. He also thought it a good plan to paint the implements once every three years. Proper care should be taken of the harness, and when the collars were taken off the horses they should be hung on pegs or a thin rail. Mr. J. Jamieson, who also read a paper, held the opinion that a farmer by joining a Branch of the Agricultural Bureau could best further the interests of the community. The Bureau had been instituted with a view to bringing the farmers into closer touch with one another, the Department of Agriculture, and its expert officers. Members should endeavor to be regular and punctual in attendance, and each member should during the course of the session contribute a paper. Again, the Bureau was an excellent medium for giving the first lessons in public speaking. Co-operative ventures of many kinds had been started in rural districts, but he thought the Agricultural Bureau was the only form of co-operation that had found an extensive footing among the farmers. The knowledge that was disseminated through the Bureau enabled the farmers to adopt up-to-date methods of harvesting and marketing their produce.

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NORTH BOOBOROWIE (Average annual rainfall, 16.35in.).

June 13th.—Present: 11 members and visitors.

THE AGRICULTURAL BUREAU.—In the course of a paper dealing with this subject, the Hon. Secretary (Mr. F. Clark) said there were very few societies and organizations that could be joined so easily as the Agricultural Bureau. It was only necessary for a person to be proposed for membership, to give his word to take an active part in the work of the Branch, and after his name had been submitted to the Advisory Board, he was duly appointed a member. Among the benefits that were conferred upon members were the opportunities that were afforded of attending country agricultural conferences, and should a district wish a subject to be brought under the notice of the Government, it could be done through the medium of the Bureau. He looked forward to the day when everyone engaged in rural occupations would be a member of the Agricultural Bureau. He held the opinion that the Bureau tended to make the whole of the State one large experimental farm, where the failures and successes of the different methods of farming in the many districts were made public to all interested persons. The discussion that took place at the meetings were most valuable, for they enabled the farmers to note and avoid mistakes that had been made by other agriculturists. Each member of a Branch was supplied, free of charge, with a copy of the *Journal of Agriculture*, which contained information from all over the State to all those engaged in rural pursuits. The expert officers of the department were ever willing and ready to give advice, and deliver lectures and practical demonstrations on subjects that constituted their life's work. Members of the Bureau should not adopt an attitude of "take all and give nothing," but be prepared to take an active part in the work of the Branch, by contributing a paper at least once a year, and entering into the discussion on the various subjects brought before the Branch. Complaints were sometimes heard that meetings of the Bureau were "too slow," and where such was the case it could almost invariably be traced to the lack of interest on the part of the members who complained. With all rural workers active members of the Bureau, he believed much would have been done to stem the rush of country folk to the city. An interesting discussion followed. The meeting then took the form of a "Question Box." The first question

submitted was "What is the best variety of vine to plant in this district?" Doradillas and currants were favored by the majority of members. (2) "When should vines be planted?" It was generally agreed that early winter was the best time. In reply to a question as to the non-fruiting of apricots, it was agreed that the bird pests were responsible, because they destroyed the fruiting buds.

#### YACKA.

April 11th.—Present: 18 members.

**HOW TO SELECT A RAM.**—Mr. H. Harrison contributed a paper on this subject. Rams should always be selected from the flocks of a breeder whose reputation was guaranteed. All animals having evidence of hereditary ailments or defects should be avoided. A delicate constitution was equally as hereditary as physical perfection. Systematic inbreeding was the only source of excellence, which meant a rigorous rejection of faulty sheep, both male and female, and breeding only from perfect animals. Inbreeding, even with close relations, as sire and daughter or son and mother, if each animal had perfect health and sound physical qualities, was in keeping with the principle of producing sound and excellent stock. Experience proved that a good ram lamb, excelling his sire, if mated with his mother, would produce better stock than even himself or his sire. Inbred animals did not throw back, therefore it could be said that close breeding preserved the strain and acted as a barrier to the introduction of foreign tendencies of every kind. The prominent conditions of successful reproduction were judicious selection and inbreeding, and without those the flockmaster would work unsuccessfully for a lifetime. If there was not a good or suitable ram on the farm it should be purchased from some well known breeder, and a good price paid, because it was false economy to purchase inferior rams. When the lambs were about 20 months old, 50 of the best ewes should be selected, and a ram purchased from the same person and mated with the 50 selected animals. If these were bred from, there would possibly be, at weaning time, 20 to 22 ram lambs. From these, the very best one should be selected, and, when the proper time arrived, he and his sire should be mated with the first selected 50 ewes, together with the 22 or so of his own age, provided they were good, but if any of them were inferior, they should be culled at once. Thus, in the first instance, one bought better sheep than was in his possession, consequently the first lambs would be better than their mothers, and those again, being put to rams very much superior to either father or mother, would rapidly improve the standard of the flock. A good discussion followed the reading of the paper.

**BLOCK E.**—Mr. H. Levein, of the Berri Branch, attended the meeting, and read a paper, "Treatment of the Soil." Messrs. Pitt, Spurling, Kubank, and Ashenden were appointed as a committee to arrange for a ploughing competition.

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**MOUNT BRYAN, May 13th.**—Several subjects of local interest were brought forward for discussion. Mention was made by the chairman of the poor interest being taken in the work of the local Branch, and it was decided that each member should endeavor to bring along a new member.

**MOUNT BRYAN, June 3rd.**—A paper, "Time and Labor Saving Appliances on the Farm," was read by Mr. A. A. Jefferies, and a lengthy discussion ensued.

**NARRIDY, May 13th.**—Several subjects of local interest were brought before the meeting, and an interesting discussion followed.

**REDHILL, June 13th.**—Mr. R. B. Scholfield contributed an interesting and instructive paper, "The Land Laws of South Australia."

## LOWER-NORTH DISTRICT.

### (ADELAIDE TO FARRELL'S FLAT.)

#### BLACK SPRINGS.

May 9th.—Present: 17 members.

**WORKING THE LAND.**—Mr. H. Gilbert, jun., who read a paper under the title, "How to Produce Better Crops by Working the Land Thoroughly," said early ploughing to a depth of from 4in. to 6in. was most essential. At the commencement of the spring weather the land should be harrowed after a good rain, and cultivated to a depth of 3in. Most of the young weeds would be destroyed, and should any survive, a small flock of sheep could be run on the fallow. Should the fallow be rough or lumpy after harvest, a rib roller or even a light harrowing would prove beneficial in smashing the clods. It was of vital importance to the farmer that he should have a first-class seed bed, for that was the foundation of a good crop. No farmer should start to sow until a good rain had fallen, unless the ground was free from weeds. The first week in May was a good time to start to sow wheat, and that would give the farmer time to finish before it was too late in the season, which should be no later than the middle of July. The hoe drill was better than the disc, because the latter had a tendency to run on the surface of the soil, thereby leaving the grain exposed to the weather and birds. A good plan was to harrow a day or two after the drill, which would cover all the wheat and destroy any weeds which had made a fresh growth.

#### GAWLER RIVER (Average annual rainfall, 17in. to 18in.).

May 15th.—Present: 11 members.

**LAYING OUT AND CARE OF THE YOUNG ORCHARD.**—In the course of a short paper on this subject, Mr. W. Patching said first of all the land should be cleared of all stones, stumps, sticks, &c., and then ploughed to a depth of from 6in. to 9in. Before commencing the marking out or digging of the holes the land should be well worked, rolled, and harrowed, because it should be remembered that such an operation would be the last time that big teams would be able to be brought on to the land. The holes should be 18in. to 2ft. square and about 18in. deep, and have the bottom soil thoroughly loosened. The trees should be planted as soon as practicable after the holes had been excavated. Many people in planting an orchard endeavored to keep the various kinds of fruit in blocks, but it had been proved that better results were obtained by intermixing the different varieties of fruit. That gave the bees a better chance of pollenising the flowers, which, in some classes of trees, was most essential if good results were to be obtained. All trees should be sprayed when first received from the nursery. Spraying was very important, particularly at the present time, because there were many diseases, which if not checked at once, would in time be the cause of considerable loss to the fruitgrowing community. When pruning and shaping the tree he preferred to leave, say, two good healthy branches. If possible the branches should be so placed that the tree would gradually develop into the shape of a cup. It was not a wise policy to try and force young trees into bearing. On an average, a peach or an apricot bearing in its fourth year would do better than one bearing at an earlier age.

## LONE PINE.

May 9th.—Present: 19 members and two visitors.

**NEGLECT OF ROADS.**—In a paper dealing with this subject, Mr. F. Fromm said that the ratepayers were actually the shareholders so far as the roads were concerned, and pointed out that every landowner abutting the road should try and preserve the road wherever it was possible so to do. The drains should be kept well open, so that whenever heavy rains fell the water would be able to get away without going over any road. Some landholders drained as much water as possible from their land whilst others preferred to make an embankment on the lower side of their property and prevent the water running its natural course. It frequently happened during flood time that a lot of soil from the land became silted up on the road through the drains being blocked, and consequently the mud accumulated on the low-lying highways to such an extent that travellers were obliged to drive in 6in. to 9in. of mud. Some favored the planting of artichokes to assist in blocking the side drains. The insufficient supply of hard stone for bottom metal was a serious problem, even though the Act only allowed 5in. bottom and 5in. top metal, making it about 30 cub. yds. to the chain. On roads such as in their district it would be preferable to have 7in. bottom and 3in. top metal, with a twin coat of blinding. It was essential that the road roller should have sufficient weight on it, and when completed heavy loads should not be allowed to go on same until it was well settled. Continuing, Mr. Fromm referred to the man who drove a big team attached to a 5-ton or 7-ton load and watched the horses walk in the one and same course, cutting the metal 1in. each time, until he had a course of about 2½in. to 3in. deep, just enough to press the metal and shoulder- ing well aside, instead of trying to pull over a few inches to even down some of the loose patches. The latter plan, if carried out to some degree, would materially lengthen the life of the roads.

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NANTAWARRA (Average annual rainfall, 15.90in.).

April 6th.—Present: seven members.

**PRODUCTS OF THE FARM.**—Mr. R. F. Nicholls contributed a paper on this subject. Animals, especially sheep, he said, when brought from the northern or southern districts did not thrive so well for a time as those that were accustomed to the local environment. It was very often necessary to modify both the environment and the organism to obtain a beneficial result in the plant and the animal produced. That was applicable to the wheat plant, some varieties being more reliable than others. To cultivate the soil and to add fertilizers was to modify the conditions to suit the plant, and that which was done directly for the benefit of the plant was also indirectly for the benefit of the animal that fed upon the plant. In a district where the rainfall was relied upon rather than irrigation, the retaining power of the soil had to be considered, and that depended upon the quality of the soil itself and the subsoil, and also the method of tilling. The latter, he said, was within the power of the producer. The maintenance of a loose surface mulch was the most essential state for the moisture retaining power of the soil. To secure the best results, the growing plant should be able to obtain all the substances it needed, they should not only be there, but should be made available for assimilation. Since the introduction of fertilizers, the yield per acre had been very greatly increased, thus making farming a much more remunerative occupation. Before fertilizers were used the producer took much out of the land annually, and returned nothing to it. If the producing power of the soil was to remain constant, the elements the plant had used should be returned to it. If that was to be done by the addition of fertilizers, it would mean a regular annual expenditure, and if the same results could be obtained by some other means it would mean a saving. That could be done partly by securing a return to the land of what had been absorbed by the plant by means of the animal or plant products themselves, by a rotation of crops, or by mixed farming. The importance of animals on the farm was becoming widely realised, because they partly replenished the soil depletion caused by the crop. Farmers should be careful not to overstock their farms, because during the dry periods the natural fodder would be inadequate to supply their demands. One problem he said, was in the marketing of the produce. A good network of railways throughout the most productive districts was of great importance, for in the absence of such facilities, not only would the produce deteriorate, but the producer would also lose many of his profits.

NANTAWARRA (Average annual rainfall, 15.90in.).

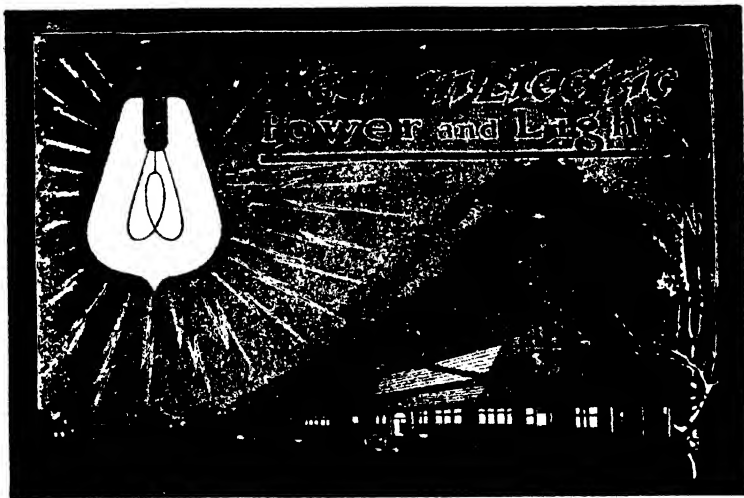
May 11th.—Present: 10 members.

**HORSE BREEDING.**—In the course of a paper under the heading, "Does It Pay a Farmer to Breed His Own Horses?" Mr. W. Dixon contended that on account of the outlay of capital and the necessity for getting the maximum amount of work out of the horses at a minimum cost, it was not possible for the farmer who bred horses to do so profitably. For the sake of argument he would take a team of 11 horses against 14 for breeding. In the first place, taking horses at a value of £25 per head, the farmer's initial outlay would be £75 greater. Then there would be the depreciation on the horses, which at 10 per cent. would cost the breeder £7 10s. more per year than the man who kept the team for working purposes only. Secondly, it would cost £27 more per year to feed the horses, if hay was valued at £3 per ton and 3 tons per year allowed to each horse. Even then, paddock feed would not have been taken into account, which he considered was worth at least 2s. per week for any horse over 12 months, and 1s. 3d. per week until the colt reached the age of 12 months. On those figures it would cost £13 to feed a young horse until he was three years old, which he contended was the correct age at which to prepare the animal for the work of the farm, and even then the colt was a nuisance in the team, and had to be frequently rested. Added to that, one had to reckon the services of a horse at £2 10s. Some people advocated the keeping of a stallion, but he considered the entire horse a big tie to the farmer. He preferred to pay £3, and insure the mare, i.e., "mare in foal or no service fee." If four foals were reared during the year, £7 10s. a head depreciation until the foals were three years old would have to be written down against each animal. That, in addition to the £3 for the service of the horse, and £27 for the extra amount of feed required for the team, would cost £24 12s. per head, and he contended it was cheaper to pay £25 for the horse without going to the trouble of breeding and rearing the foals on the farm. In the discussion that followed, Mr. R. F. Nicholls agreed with the writer of the paper, and said he was keeping no more horses than those actually required for the working strength of the farm. Mr. C. Nicholls said he had kept a stallion for 12 months, but had finally disposed of him because the animal was too much of an inconvenience. Mr. G. Herbert believed in breeding horses on the farm, but he admitted that the figures quoted by Mr. Dixon had given him food for very serious thought.

#### OWEN.

June 16th.—Present: 12 members.

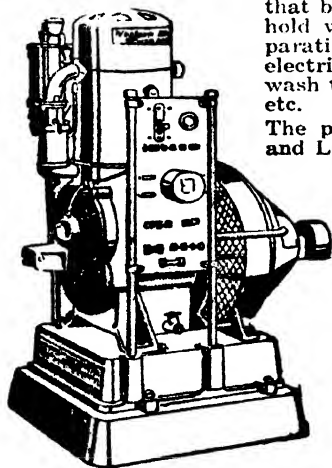
**SHEEP ON THE FARM.**—Mr. H. Bowyer, who read a paper on this subject, said:—Not many years ago sheep were regarded as a side line on the farm by many farmers on small holdings, but of later years agriculturists had come to the conclusion that wheat growing could not be carried on with the best results without them. Sheep were very useful in keeping down weeds on the fallow during the summer months, and also during seeding time, for it was much better to pass the herbage through the sheep, and thereby enrich the soil, rather than allow the weeds to dry up after the cultivator. Then, again, the farmer, through the sale of wool and mutton, was able to add to the revenue of the farm. Before undertaking the handling of sheep, the farmer should be fairly certain that he would be able to supply the stock with plenty of feed throughout the whole of the year. As an example, he intended to deal with a farm of, say, 1,200 acres, and to work it on a three-year rotation—400 acres under wheat, 400 acres for fallow, and the remaining 400 acres devoted to pasture. With a fair season, and a little hand feeding, the holding should safely carry 300 ewes, and with a 70 per cent. lambing the flock would be increased by 210. At 12s. 6d. per head the lambs would return £131, and a good ewe should cut at least 10lbs. of wool, which, at 1s. per lb., on 300 sheep, would be £150, making a total of £280 from the farm flock. He favored the large-framed, strong-constituted, dense-woolled merino for the Owen district. After being shorn, the sheep should be carefully run through the dip, and pastured on good feed, in order to be ready for mating early in December. A good fresh paddock should be held in reserve, so that the sheep could be brought up to the right condition for mating with the rams. If a Shropshire ram was crossed with a Merino ewe, a good strong early lamb, fit for the export trade, and a good fattening sheep would be obtained. To secure the



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best results no more than 50 ewes should be allowed to each ram. During March the rams should be taken out, in order to avoid summer lambs. In April the ewes should be carefully crutched to keep them clean, and to assist in protecting them against the blowfly. During April the stubble and grass paddocks would show signs of being eaten out, so that the sheep should be watched to see that they were still in good condition. If necessary, hand feeding should be resorted to. He preferred hay to chaff, as there was some difficulty in getting the animals up to use the feeding trough. If fed carefully with hay, there would not be very much waste. May brought the lambing season very close at hand, and the ewes should be paddocked close to the homestead. If that was done the foxes would not trouble them so much, and the flock master could go amongst them every day to see if any ewes needed assistance. Every ewe or lamb saved was worth money, and would pay for a little time and attention. When the lambs were strong enough, the mothers should be turned into a fresh paddock as often as possible, so that the lambs would make a steady growth, until they were ready for market. At four to six weeks of age the lambs should be tailed, a nice warm day being selected for the work. It was important to dip the knife in a good disinfectant after each lamb had been tailed. If the lambs were supplied with good feed, they should be ready for market at four to five months old, in order to give the ewes time to get in good condition for the spring. After shearing the wool should be carefully baled, and the sheep branded for the next year's work. In the discussion that followed, Mr. C. L. Marshman thought that sheep on the farm should be confined to the rearing of fat lambs, and that wool should be a secondary consideration. He thought the Merino ewe and the Shropshire ram cross the best for breeding lambs, and had found feeding sheep with chaff satisfactory. Mr. T. A. Freebairn agreed that sheep were a great help on the farm, from a manurial standpoint, and that they kept the fallow clean. He preferred using the knife for tailing. Mr. W. J. Marshman stated that one could not get the best returns from the farm without sheep. They were necessary to keep fallow clean. He was of the opinion that 400 acres was too much land to leave out in a 1,200-acre farm for sheep, in expensive classes of land. The Merino was a very hardy sheep, with splendid wool, but they did not make themselves at home as did the crossbred. The best ram for breeding fat lambs, he considered to be the South Down. Lambs of that breed were the best he had ever reared on his farm, but they were very susceptible to worms and footrot in wet districts. Undoubtedly chaff feeding was the most economical, and sheep took to it readily. He advocated the use of rock salt in sheep-feeding troughs. A little corn was also an advantage at first. Mr. T. S. Freebairn liked an over-cast day for tailing lambs, as there was less chance of frosts affecting the animals. Mr. R. S. Harkness stated that the Merino ewe was generally used for breeding on the farm, principally because she was the easiest to procure. Although the Merino wool held first place, sheep of that breed did not make such good mothers as the crossbreds. In his opinion the South Down was the best ram; it threw a lamb which, for compactness, sweetness of flesh, and export trade, was not to be excelled. A trough made of manure bags sewn end to end, with a wire each side and one along the bottom to hold the feeder securely, was very serviceable for hand-feeding sheep. He contended that foxes would go right up to the house after the lambs if they were very hungry. It was best to tail the lambs in a grassy field, as then the danger of the animals contracting disease would be reduced to a minimum.

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#### ROSEDALE.

June 7th.—Present: 17 members.

**FALLOWING.**—Mr. S. Gursanske, who contributed a paper on this subject, said fallowing should be commenced immediately after seeding was completed. For their district he recommended ploughing to a depth of from 3in. to 5in. If the land was very wet, he did not think it advisable to work the plough, because the red land had a tendency to set down very firmly. Black land should not be worked too deeply, otherwise the soil became too loose to make a firm seed bed. As much straw as possible should be ploughed in, in order to provide organic matter for the crops that were to follow. If there was any difficulty in dealing



with the straw a disc coultter could be attached to the plough. Rather than over-work the land, he would allow the sheep to run over the fallow. At the end of August or September the fallow should be harrowed, but that would not be advisable if the land was very wet. After the harrowing, the cultivator should be worked, but not so deeply as would injure the seed-bed. If it was found necessary to give the land an additional working, the cultivator harrows could with advantage be used for the second cultivation. Just before harvest he thought it a good plan to work the cultivator harrows or scarifying harrows to destroy stinkwort. After every fall of rain the harrows should be run over the fallow to assist in the conservation of moisture. Where the farmer had a large area of black soil to deal with, the speaker recommended summer fallowing, because the sticky nature of that class of soil made it impossible for the teams to work it during the winter. With summer fallow, it was best to cultivate as soon after seeding as possible. Where the soil was very firm it should be cultivated with narrow shares; the broad shares could be used for subsequent tillage operations. The cultivator harrows would be found very useful for destroying weeds during the latter part of the year. Whilst it would be more advantageous in a dry year to do the fallowing with a cultivator, he realised that it would not be wise to omit ploughing for two consecutive seasons. After harvest a roller should be used to break the clods where the land was very rough.

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## TARLEE.

May 9th.—Present: 26 members and two visitors.

GROWING BARLEY OR OATS AFTER WHEAT.—In the course of a paper under the heading, "Is the Growing of Barley or Oats after Wheat Profitable?" Mr. A. Clarke said it was generally recognised that land on which it was intended to sow wheat required a different treatment from that on which oats were sown. Barley and oats could be sown for early feed, after which the stock could be taken off and the crop harvested, or the secondary could be sown after the wheat had been drilled in. He did not favor the first method unless the land was fairly clean, otherwise the weeds would make more headway than the crop and choke out the plants. With the latter method there was every prospect of securing a good crop, and it was safe to say that land that would yield a 20bush. crop of wheat on fallow should return from 25bush. to 30bush. of Cape barley; while on stubble land just about the same return of malting barley and oats could be expected. At first glance it would appear that with less work in preparing the land and larger returns per acre, the proposition was a very profitable one, but the great difficulty was to secure a market for the cereals. Last year the area sown with barley and oats in South Australia was just over half a million acres, whilst nearly three million acres were devoted to the cultivation of wheat. Of that three million acres, it could be safely said that one and a half million acres were grown on fallow. What would happen next year if that million and a half were put in with barley and oats? With the half million acres garnered last harvest, the price for Cape barley and oats was about 2s. 6d. a bushel, with a little more for malting barley, and, unlike wheat, there did not seem to be any chance of an export market, so that should the sowing of stubble with barley and oats become general throughout the State, and the corn thrown on the market, the price would hardly be sufficient to pay for the sacks and the carting of it out of the paddock. Fortunately, that was not the only way of marketing the crop. There was a profitable market at present for a limited supply through livestock, and also a prospect of being able to market it all that way. The value of oats for the feeding of horses was well known, and if farmers were to use more oats with chaff they would find that they would not want nearly so much hay, and also that the horses would be in better heart for their work. Again, oats had been proved to be equal to bran for increasing the flow of milk in cows. He felt certain that it would pay most farmers in that district, who had a small flock of ewes, to sow oats, in order to have a stand-by during the autumn, when most of the summer feed was gone. During the last month, when feed was getting scarce, and the lambs were being dropped, some of the lambs were very miserable, and others the ewes had left; whereas if the ewes had been given a  $\frac{1}{2}$ lb. to  $\frac{1}{4}$ lb. of oats each every day with their other feed, such a happening, in all probability, would have been avoided. The extra price that would be received for the lambs and wool would make the sowing of a portion of the stubble with oats for the sheep a very profitable undertaking. With barley there was practically only one way of marketing the grain—through livestock, chiefly pigs, and there was no doubt that for the production of pork and bacon of first quality barley was the best grain. It had been stated by Professor Perkins in the *Journal of Agriculture* that if farmers could depend upon a minimum of 4d. a pound live weight for their pork, it would pay them to grow barley as a second crop, and feed it to pigs. Here again the producers were up against the difficulty of finding an export market, for it was useless relying on local consumption. England was a big importer of pig products. In fact, in 1919 the pig products realised the highest price England paid for imports, which the Commonwealth as exporters was interested in, realising £109,000,000; while wool, which was next on the list, was £96,000,000. Of that total for pig products about 94 per cent. came from America and Canada. Why should not we be able to export as well as Canada and the United States? The standard of living and wages were just as high, if not higher, in those countries than they were in Australia, and whereas America grew and fed with maize, farmers in Australia could grow barley, which was even better for pigs. Even before the war America was supplying over half of England's bacon, while our producers were doing practically nothing; but as things were to-day no trade could be opened up until an export market for the pig was established. If that was done, barley on stubble would be grown very widely and profitably. There was no doubt that with the gradual decrease of the area of farms, and the big price that land was bringing, the farmer would have

to increase his returns to make a living. Perhaps for a few years the best plan would be to keep on with fallowing and the cropping of wheat, but how long would the productive quality of the land stand such a strain. It was well known that continuous fallowing depleted the soil of humus, and a time would probably come when the land would have to be supplemented by nitrates, which was a very expensive undertaking. The sowing of the stubble would help to delay that time, if not prevent it. At present it would not pay to sow all the wheat stubble with barley and oats, unless a profitable export market was found for either the grain or the stock, but it would be profitable to put enough in, so as to have some oats for the horses when they were working, also for the cows and sheep during the dry time in autumn, and enough barley for a few pigs; and on no account would it pay to neglect the sowing of wheat on the fallow, to sow oats and barley on the stubble. In the discussion that followed, Mr. J. McInerney said it was better to sow barley on hay ground, and thereby save the necessity for burning off the stubble early for that purpose, and lose the full value of the stubble feed. Mr. A. L. Molineux said that in the year 1915-16 he had sown 80 acres of barley, the crop had been fed off three times by 350 sheep, and 40 bush. to the acre had been reaped at harvest time. In 1918-19 90 acres of barley had been drilled in on stubble land, the crop was fed off, and finally yielded 18 bush. to the acre. Fifty pounds of seed and 45 lbs. of super had been sown, and the grain realised 4s. 6d. per bushel. In 1920-21 70 acres had been put under barley, the crop fed off twice, and 30 bush. to the acre had been harvested. In 1921-22 55 acres were fed off twice, and returned 27 bush. to the acre; 55 acres of oats averaged one ton of hay per acre. The land was cultivated whilst in a dry condition and drilled in dry before the wheat was sown. Mr. Molineux thought that reaping barley and losing some of the grain gave good feed in the stubbles the following year. Mr. J. Kelly advocated sowing barley for feeding off when the crop was in head. Mr. Nash said in the year 1920-21 he fed his barley to pigs, which brought in 8s. per bushel on the hoof, and at that time the selling price of barley was 4s. per bushel.

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March 28th.—Present: 16 members and visitors.

Mr. H. O. Robinson contributed a paper, "Farmers Accounts and the Keeping of Them," and an interesting discussion followed.

**USEFUL HINTS FOR THE FARMER.**—At a further meeting held on May 8th, Mr. S. A. Wasley contributed a paper on the above subject, in which he said all vehicles and implements of the farm that were not wholly constructed with metal should always be kept under cover when not in use. All the woodwork of the machines and wagon should be given a coat of hot boiled oil once a year. He considered it a good plan when putting away the harvesting machinery to mark on a prominent part of the implement the names of any parts that were worn, so that new parts could be ordered without delay. No farm was complete without a fully equipped blacksmith shop, and on wet days many profitable hours could be spent in repairing machinery. With a little experience he believed the farmer would soon be able to shoe his horses. The grader or winnower for cleaning the wheat for seeding should, if possible, be kept in the barn, when the work of pickling could be performed on wet days. A considerable saving of time during seeding would be effected if the bags of wheat were marked, as to the variety they contained, when carted into the barn at harvest time. By laying the new and any good second-hand empty cornsacks flatly on the ground, it would be found that practically no harm would result to them through the attacks of mice. A separate peg should be provided in the stables for the harness for each horse, and before commencing work each should be groomed, special attention being paid to the collars and shoulders of the animals. He recommended gall cure for the healing of sore shoulders. All the harness should be given a dressing of neatsfoot oil at least twice a year. Where water was laid on to the farm, he thought it advisable to have a trough at the end of the stable yard, so that the horses could have a drink whenever they desired. A bathroom should be erected, so that the teamster could have a bath at any time.

**WILLIAMSTOWN (WOMEN'S).**

June 7th.—Present: 15 members.

**FOOD VALUES.**—In the course of a short paper dealing with this subject, Mrs. Cundy said food was essential to life, and the nourishment obtained from it assisted in building up and maintaining the strength of the body. Bread, soup, and vegetables all had their place in adding vitality to the system. Puddings, especially where milk and eggs were freely used, were most beneficial to the health of the consumer. Good ripe fruit had its value, and could be eaten liberally. All food should be pure and wholesome, and free from all kinds of harmful preservatives. Where preservatives were necessary, salt, sugar, and other harmless flavorings should be added, which would not reduce the value of the product. The food should be kept from contamination with dirt, special care being exercised to keep it away from flies and dust. Mrs. Hammatt also read a short paper on the subject. All food, she said, could be classified under five headings. First, proteids, such as milk, eggs, peas, beans, and meats that were necessary for life. Second, mineral salts, such as were found in fruit and vegetables, to assist in the formation of bones and teeth. Third, water; though water formed more than half of every food, it was still necessary for people to take it in liquid form. Fourth, sugar and starch, which were the chief sources of energy, and were found principally in bread, sugar, cereals, jams, honey, and potatoes. Fifth, fats and oils; these supplied heat and energy, and were contained in butter, dripping, suet, cheese, and oats. A well-planned meal should contain foods in due proportion from each group.

**LYNDONCH, June 8th.**—The meeting was devoted to a discussion on the arrangements for the forthcoming pruning competitions.

**ROSEDALE, April 18th.**—The meeting took the form of a "Social Evening," which was attended by a large number of members and their families and friends.

**SADDLEWORTH (WOMEN'S), June 13th.**—There were present at the meeting 10 members and three visitors, when a paper, "Bread and Cake Making," was contributed by the Vice-President (Mrs. Neumann). A collection of home-made bread, yeast cake, and buns was exhibited. This paper was most interesting,

as also the diagram of yeast cells. The members exchanged ideas, and a very profitable as well as an interesting hour was spent. It was decided to give prizes at the next local show for vegetables grown by children attending the public school.

**SADDLEWORTH**, June 6th.—An interesting and descriptive paper, "The Advantages of the Roseworthy Agricultural College," was contributed by Mr. F. W. Coleman.

**SALISBURY**, June 6th.—The meeting took the form of a discussion on the subjects, "Milk Fever" and "Jersey Cattle," which were introduced by Messrs. A. Urlwin and R. Bagster.

**WATERVALE**, June 12th.—The meeting was devoted to a discussion of several subjects of local interest, including pruning, spraying, and planting orchards and vineyards.

**WILLIAMSTOWN**, June 9th.—Mr. J. B. Harris (Orchard Instructor and Inspector) gave a pruning demonstration in the afternoon, and in the evening delivered an address, "The Fruit Industry."

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(TO BUTE.)

BRENTWOOD.

April 20th.—Present: 13 members and three visitors.

**ROTATION OF CROPS.**—Mr. R. G. Anderson read the following paper on this subject:—“Every farmer should adopt some system of cropping his land in rotation in order to secure better results. On account of the varying nature of the seasons we cannot always stick to any hard and fast rule, but if at all possible I would adopt the following system:—Bare fallow, followed with wheat, then barley or oats, with Cape barley sown on the hay stubble the following year for feed for stock and the raising of lambs. The preparation of the fallow is just as important as the sowing of grain. I suggest that the plough should be started at a depth of about 3in., as soon as possible after seeding operations are finished, say early in July, as early fallow conserves the moisture better, and if well worked, gives a better chance of killing weeds. This should be followed by the harrows at least once, or better still, twice, if time will permit, and again, if possible, after each heavy rain. After the rubbish comes up I would put the skim plough over the fallow, working it to a depth of 2in. By this time it should be broken down nice and fine, and if summer rains are received I would suggest harrowing again to conserve the moisture. During the summer months the sheep can be grazed on the fallow. If, after the harvest, the fallow is dirty, use the skim plough or cultivator. On light land that is inclined to drift, or where the weeds are small, I prefer the cultivator; but if the weeds are large, the skim plough is undoubtedly the better implement, but in any case work as shallow as possible. I do not favor working the fallow any more than is necessary during the summer months, but like to have the sheep running on it, as they do a lot of good, both in checking the weeds and in packing the soil. In preparing stubble land for seeding time, I think the wheaten straw should be burned off early in March and the land worked with a cultivator or skim plough to a depth of about 1½in. in order to bury weed seeds as lightly as possible, so that they will shoot with the first rain. After a good rain I would work back the stubble ground that I intended sowing with oats for hay, and follow on with the drilling of same, so as to give the oats as much time as possible in which to grow. I prefer growing of oats for hay, as I consider them a better feed than wheat for horses. Although prices for oats have been low of late years, I think every farmer should grow some for sale or for his seed and feed. Oats mixed with cocky chaff make a good feed for the team, and if the oat stubble is cut and stacked, is a great help in providing fodder for the idle stock during the cold weather. One and a half bushels of seed with 90lbs. of super would be a good dressing for oats. Having finished sowing oats, I would turn my attention to the fallow, which should be ploughed back about 2in. to make a good seed-bed. If late varieties of wheat are sown, they should be drilled in immediately after this cultivation, but I prefer a mid-season wheat, as late wheats often take too long to grow, and if the weeds are thick they often check the growth of the wheat plant. One bushel of clean seed is sufficient for late wheats, and 1½bush. for mid-season wheats, with 1cwt. super or perhaps a little heavier dressing of super to the acre in heavy land; but where the land is stony I consider a heavy dressing of super is not so profitable, because the plant is forced when young, and cannot hold out so well if we get a dry spring. Wheat sowing should, if possible, be finished in May, and then, when the fallow ground has been sown, I would continue on the stubble land intended for the barley crop. This should be prepared similarly to that on which the oats were sown, using about 1½bush. of pickled barley with 90lbs. to 100lbs. of super to the acre. Some farmers maintain that it pays to grow barley on the fallow. This may be so, but I think barley will follow wheat better than barley after barley, and show a fair profit, and it is to the second crop on the fallowed ground that we look for our profits in working the land. Then again, with the uncertainty of prices in the grain market, I think a farmer is wise in growing both wheat and barley, as he would probably strike a bad market when he has all wheat or all barley. I suggest sowing the hay stubble with Cape barley for feed for stock or raising of lambs. Cape barley is a quick grower, and is a good fodder, and if sown early in April, so as to come up with the first rain, it will make early feed for stock or sheep. One bushel of barley

to 56lbs. super will be a sufficient dressing in this case. This need not be pickled, but the wheat and English barley needs pickling, using about 1lb. bluestone to the bag of wheat and 1½lbs. bluestone to four bags of barley. All seed should be thoroughly cleaned before drilling to ensure even sowing." In the discussion that followed, Mr. C. H. Boundy did not agree with the shallow ploughing of stubble land. He favored a depth of 2in. or so, and used the cultivator afterwards. Mr. R. Anderson said that in the early days ploughing to a depth of about 1½in. had given two excellent crops in succession without the aid of artificial manures. Mr. J. Boundy compared the present-day methods of farming with that of the times before the super era. He spoke on the value of artificial manures, and said that this season farmers had ordered more super than ever before, that being a step in the right direction, and subsequent results would be noted with interest. He was usually unfortunate with hay on stubble land, and so preferred fallow, which resulted in a heavier yield from a smaller area. He agreed with the paper in regard to oaten hay, and the growing of Cape barley as fodder for sheep and lambs, and with a previous speaker in reference to the deeper ploughing of stubble land. It was getting fairly well recognised that the barley grown around that part of the Peninsula was the best in Australia, and in referring to the custom of following a wheat crop with barley, he cited a case in which barley following barley had proved very successful. Mr. R. G. Anderson, in reply, said that in regard to ploughing and cultivating stubble land for barley, his practice was to plough the first paddock to be put in and use the cultivator before the drill, because the weeds would not have made very much growth. The weeds being larger in the following paddocks, he used the cultivator first and followed later with the skim plough.

MIXED FARMING.—At a further meeting held on May 18th a paper on this subject was contributed by Mr. F. J. Babbage. The speaker said with a farm covering a square mile of country, 250 acres could be devoted to cropping, viz., 100 acres of wheat, 100 acres of barley, and 50 acres of crop for hay. With a fair season, that area should yield from 1,100 to 1,200 bags of wheat, which at 10s. per bag would return about £600. With 100 acres set aside for fallow, 200 acres would be left for the stock. If a couple of 15-acre paddocks close to the homestead were sown with barley, feed would be provided for the horses and cattle. The remaining area of the property, 260 acres, could be kept for the sheep, and should carry about 130 breeding ewes. The wool from the ewes should return £50, and the lambs from the ewes another £50 or £60, after making allowance for losses from foxes. The working strength of the property should consist of eight team horses, and they should prove sufficient if up-to-date implements were used. A couple of foals should be bred each year to replace the older animals. Referring to dairying, the speaker thought about eight good cows should be kept, so that two cans of cream could be sent to the market every week. In addition to that the household would be supplied with milk, butter, and cream throughout the whole of the year. If good water were available he thought it would pay to put in a plot of lucerne for the benefit of the cows during the summer months. He believed that the eight cows should bring in about £120 per annum. Two breeding sows should be kept, and with an average of eight pigs per litter, 32 pigs could be topped up for the market every year. Feed would consist of pollard and separated milk. The pigs should realise 50s. per head in the market, and during the 12 months could be reckoned on yielding a profit of £80. Fowls were also a profitable side line, and if the flock was properly cared for, £40 per annum could be expected. For the working of such a property he thought a married man and a reliable farm hand should prove sufficient. In opening the discussion Mr. J. Boundy considered mixed farming essential to a man on a small holding. Fifty acres for hay, as advocated by the writer of the paper, seemed proportionately to the size of the farm rather a large area, but he presumed that a portion of the hay would be used as fodder for sheep and cows. He thought if a man had to buy all the grain, &c., required for pigs they would not prove very profitable. In regard to help on the farm, he considered single men better than married. Mr. J. J. Hoaner voiced the opinion of most of the members when he stated that Mr. Babbage would have raised an interesting discussion had he provided his estimated expenditure. With the paper's area under crop each year he thought that more than 130 ewes could be carried. His opinion was that cows took up too much time and pasture, and that locality

only proved profitable for four months in the year, one or two cows being all right for household purposes, but more than that he regarded as merely a hobby in their district. He agreed with a previous speaker that there was little profit in pigs if the grain consumed were taken into account. As side lines he considered sheep and poultry absolutely the best propositions.

#### WEAVERS.

May 8th.—Present: 13 members.

**BARLEY GROWING.**—In the course of a paper dealing with this subject, the Hon. Secretary (Mr. L. A. Slade) said barley growing as it was understood at the present time was practically unknown in their district 20 years ago; to-day it was the chief cereal under cultivation. In the early days it was generally believed that extensive barley growing would permanently impoverish the soil, but such was not the case, for as many as three successive crops had been taken off the one farm. The speaker maintained that the selection of the seed was of vital importance to the ultimate success of the crop. The grain should be a good sample, plump, and free from smut. After having tried many methods of pickling, he had come to the conclusion that bluestone used in a 1½ per cent. solution in a tub, and the grain treated about three or four weeks before sowing, was the best procedure to adopt. The quantity to sow was a very debatable point, but from experience he thought about 55lbs. of seed sufficient; if sown on fallow land one could safely use a little less. Should the land be very dirty, the quantity should be increased to 75lbs. On fallow land he recommended 75lbs. of super, and considered from 90lbs. to 100lbs. quite sufficient for other classes of soil. The best time to sow was, on the average, during the last fortnight in June or the first fortnight in July. Where the crop was making too much headway, it was a good plan to graze it off with sheep, but that practice should never be adopted later than the end of July. In spite of the advances that had been made with all varieties of agricultural machinery, he did not think there was a machine for harvesting barley that would give real satisfaction to a critical grower. A few producers favored the stripper and motor winnower, which made the work very tedious, while the majority gave preference to the larger types of harvesters and headers, and were content to put up with certain losses that were inevitable. In the discussion that followed, the chairman was of the opinion that the old-time method of pickling on the floor was useless, and recommended the practice of pickling soon after harvest. Mr. A. Sheriff was of the opinion that barley grown on fallow was not equal in quality to barley grown on stubble ground, to which Mr. Slade replied that he had never received any less money for barley grown that way. Mr. J. Sheriff was strongly against barley growing on fallow land. A discussion then ensued as to the profitableness of wheat *versus* barley, and the opinions were equally divided, the chairman taking the stand that over a period of ten years wheat growing would pay better. The opposite view to that was taken by the reader of the paper.

**MAITLAND, June 8th.**—Several items of local interest were brought before the Branch for discussion. It was decided to donate £2 2s. to the Maitland Agricultural Society, to be awarded in the farm competitions.

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#### WESTERN DISTRICT.

**RUTLER** (Average annual rainfall, 16.61in.).

May 8th.—Present: eight members.

**FARMING IN THE MALLEE.**—Mr. W. G. Stewart, who read a paper under the title, "Five Years' Experience in the Mallee and Mistakes One Makes," said the first five years' experience of mallee farming was an experience that was not easily forgotten, and to the majority of settlers not a very enviable one. A mistake that was commonly noticed on a number of new blocks was that of trying to get rid of the scrub more quickly than the bushes could be destroyed. Again, it was frequently observed that a settler was endeavoring to carry too many head of livestock before the proper steps had been taken to check the growth of the bushes.



In the past the mistake of not finishing seeding sufficiently early in the season to enable a prompt start to be made with fallowing had also been made. Too much attention could not be given to the very important question of water conservation, and ample provision should be made for good water supplies on the holding. Another item which he thought could come under the heading of "mistakes" was the neglectful manner in which the machinery of the farm was driven, and the oversight in not keeping bolts and nuts screwed up tightly. Finally, the homestead, outbuildings, and fences should not be neglected, but kept tidy and in good repair. An interesting discussion followed, in which Messrs. C. Jericho, P. and R. Phillis, and J. Hughes took part.

### COLLIE.

May 13th.—Present: 13 members.

**PICKLING WHEAT.**—Mr. R. M. McKenzie, who read a short paper on this subject, considered hand pickling of wheat to be the most effective method. The procedure he adopted was to make a hole, with sloping sides, 10ft. long by 8ft. wide and 4in. deep, in the ground. The sides should be coated with cement, and with a hole of that size three or four bags of wheat could be treated in one operation. The chief point was to see that every grain of wheat came into contact with the pickle. He usually dissolved from  $\frac{1}{2}$ lb. to  $\frac{3}{4}$ lb. of bluestone in boiling water and added that to 5galls. of water, that being sufficient solution to treat three bags of seed. After the wheat had been emptied into the hole, the pickle should be sprinkled over the grain, and thoroughly stirred, after which it should be placed in the bags. The butts of wheat should not be tied up after pickling until the grain was thoroughly dry. It was also important to dip the cornsacks in the pickling solution to prevent the seed from being reinfected with smut. If super bags were used for that purpose he believed the pickle would counteract the action of the acid and prolong the life of the bag. In the discussion that followed, Mr. H. Shipard agreed with the view of the writer in so far as the method being a thorough and practical one; however, he believed Nature was the best pickle, viz., sow the seed on the surface, allow it to lie for a few days, then harrow it in. Mr. D. Gunn thought pickling a full bag at a time in a cask or hole, using strong solution, quite an effective method. Mr. H. Dodgson contended that a solution stronger than 1 per cent. would destroy the germinating power of much of the grain. Mr. W. Shipard thought that, providing the grain was sound, the solution, however strong, would not affect its germinating powers.

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## COLTON.

May 10th.

**FIRE CONTROL.**—In the course of a paper on this subject Mr. F. Shipard said it was most important that our farmers should prepare safe firebreaks before commencing burning operations. First of all, suitable and seasonable weather should be chosen, and if stubble or grass had to be burnt, he suggested a break of ploughed land half a chain wide. If the stubble was very heavy, it would be advisable to harrow or rake the strip of land to be ploughed before the fire was started. Where one had to deal with bush, scrub, or timber, more care was necessary. For an average growth of scrub, a clearing 1 chain wide should be made, and even then good judgment was essential to ensure safety. Fires had been very prevalent and disastrous in their district during the past season, and he believed much of the devastation was due to carelessness on the part of those starting the fires. He was of the opinion that it should be compulsory for all people to prepare wider breaks than was now the usual practice and to exercise more care in starting fires.

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**ELBOW HILL.** (Average annual rainfall, 11in. to 12in.).

April 8th.—Present: seven members.

Mr. A. Wardle delivered an address on the subject, "Economics," in which he compared the economic conditions of America with those of Australia. Figures showing the output of different commodities of the two countries were quoted by the speaker, and an interesting discussion ensued.

**POULTRY *versus* DAIRYING AS A SIDE LINE.**—At a further meeting, held on May 13th, Mr. S. V. Wake read a paper in support of poultry as a side line. The speaker said fowls, if systematically managed and regularly attended to, were a line well worth while every farmer taking an interest in. Fowls could be kept very economically, and the birds took less attention than cows, thus leaving more time for general work. In their district fowls returned a better revenue than cows, because green feed was only available for about six months of the year, and probably not at all when the cows had freshened. To get the best results from fowls one should have a breeding pen or two for choice birds, preferably White Leghorns. It was also advisable to have a few of a heavier breed for table fowls, also keeping in mind their egg-laying ability. Breeding pens would more than pay for the extra trouble taken, as they enabled the farmer to prevent the quality of his flock from deteriorating by selecting birds to maintain a high standard. Another advantage of breeding pens was that where the fowls were running out, the eggs need not be fertile. He believed that farmers would receive better returns from the poultry if only guaranteed infertile eggs were marketed. The number of the hens kept should be gauged by the quantity of feed on hand. All roosters should be separated as soon as the sexes could be determined. Shelter was another important factor, and nests should be erected, if possible, in straw roofed sheds, with a plentiful supply of water. Green feed should be grown where possible in summer for the fowls. If the work was carried out on the lines indicated, he believed that fowls could be made a very payable proposition. Mr. P. Wheeler then read a paper on "Cows as a Side Line." Cows were a necessity on the farm, he said, and should therefore be kept as economically and as profitably as possible. Instead of their being a necessary evil, they should be made an asset. The first point to consider was quality; time spent on mongrel cows was time wasted. Jerseys were the most profitable cows for dairying purposes; they were the richest butter cows and their small frames needed only about half the amount of feed that was required for the larger breeds. Four cows, properly managed, would be sufficient for the average farmer. The cow yard should be in a convenient place, not too far from the house, and the animals yarded and fed overnight. Cocky chaff with bran and molasses was the best and cheapest food for cows. If provision was made and the cocky chaff stored in a shed convenient to the yard, no time would be lost in feeding. When yarded overnight the cows could be milked before breakfast. In busy times a man should be able to feed his horses, milk the cows, separate, and have breakfast while his horses were feeding. Four good Jersey cows, kept on the lines indicated, and timed to come in in the months from April to July, should return at least 8lbs. of butter per week, and on an average of 1s. per pound for the produce, the return would be about £20 per year, and with a

deduction of, say, £5 for molasses and bran, would give a profit of £78. The calves by a good Jersey bull, which it would pay to keep, would be worth at least £8 per head at one year old, bringing the total income up to, approximately, £100. A keen discussion followed the reading of the papers. Mr. Wardle favored fowls, as they did not involve so much work as the cows. Mr. T. Wildman thought both were very necessary, but favored fowls, as they took less time, and with proper attention to breeding, &c., would return good profits. Mr. Ramsey did not like the Jersey cows on account of their small frames. He advocated the Herfords, as they were good for both butter and meat. He did not favor either side line, because they were both necessary on the farm. Mr. Watson thought cows were most suited to men with large families, as they involved a lot of work and time. Mr. Williams thought it difficult to choose between the two side lines. He pointed out the benefits of cows in rearing calves and pigs, &c. Mr. Story thought cows were the cheaper to feed, as it was only necessary to feed the animals for three months of the year. Fowls did not make so much work, and they were very profitable. He favored cows. Mr. L. Pearce thought cows were the more profitable. Mr. A. Wildman said in keeping fowls it was necessary to make netting inclosures for the machinery, which was expensive. He preferred keeping cows. Mr. Cowley thought both side lines were necessary on the farm.

GOODE (Average annual rainfall, 12in. to 13in.).

May 10th.

**WATER CONSERVATION.**—In the course of an address on this subject Mr. L. Weir said every farmer in their district should realise the importance of providing adequate water storage capacity. If farmers realised that sheep would drink about 200galls. per head and great stock about 3,500galls. per head per year, and provided the necessary accommodation, water carting would be less frequent. Owing to drought and dry times every farmer should build tanks to hold enough water to carry him over two years. The land in the vicinity of Goode had not sufficient

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clay in it to allow conservation of water in dams in the summer, although they would hold very well for a few months during the winter, and well repay a farmer for the time spent in the making, even if he could only use it during the winter months.

#### MOUNT HOPE.

June 10th.—Present: seven members and visitors.

**THE FARM GARDEN.**—In the course of a short paper on this subject Mr. T. Speed said on a farm where a water supply was available a plot of land should be set aside for a garden. If the water was not fresh, trenches should be made and the water allowed to soak through to the plants. If the land was of a red loamy character, a few loads of sand should be carted and dug into the soil. The plot should be about one chain square, and a trench made through the entire width of the plot to take the water to the plants. A short discussion followed.

**PICKLING WHEAT.**—Mr. H. H. Myers, who read a paper on this subject, said the methods used in pickling wheat were many and varied, and it would be difficult to say which was the best, as each had been tried with a fair amount of success. He did not think the old style of pickling on the floor could be excelled for quickness and effectiveness, as fresh bluestone was mixed each time, thereby keeping up a uniform strength in the pickling solution. He had always pickled in a cask and used 1lb. of bluestone to every 10galls. of water. The method he had adopted in the past was to obtain a 30gall. cask and an old cement drum that had been cut down to hold half a bag of wheat. Small holes should be punched in the bottom to allow the water to drain off. In the discussion that followed, Mr. Speed was of the opinion that the wheat should be thoroughly dry before sowing, and that the old style of pickling was the best. He also said some wheats were more liable to smut than others. Mr. G. A. Vigar said the method he adopted was to get a trough which would hold three bags of wheat. He then prepared a solution of 8galls. of water and 1 per cent. bluestone, which was poured over the wheat and stirred backwards and forwards three or four times. He thought the wheat should be sown as soon after pickling as possible. Mr. R. L. Myers was of the opinion that wheat should be thoroughly dry before sowing. He pickled the wheat in a cask, and said the bags should also be soaked in the bluestone in case of smut balls.

#### ROBERTS AND VERRAN.

May 12th.—Present: eight members and five visitors.

**BREEDING AND CARE OF PIGS.**—Mr. C. Kunst, who contributed a paper dealing with the subject, preferred the pure-bred Berkshire to the Mid-York. He contended that the former matured more quickly and were more contented than the latter. Small paddocks of barley or oats for feed during the summer months should be made close to the sties, for besides providing exercise for the animals, a very considerable saving in the feeding would be effected. In addition to the grazing, the pigs should be fed twice each day with soaked barley or oats. The best plan to adopt was to pour hot water on the grain and cover the bucket with a bag to prevent the steam from escaping. For young pigs he recommended pollard and milk or pollard and water, and as they became older corn could be added to the food. At farrowing time a separate sty, with plenty of room and sunlight, should be set aside for the sows. Castrating should be performed when the young pigs were about six weeks old, and they should be left with their mother for a time to get over the effects of the operation. He considered it a good plan to leave one pig with the sow, to assist in drying off the milk supply. With the prospects of a bacon factory being established on the Peninsula he considered that the breeding of pigs would be a very profitable side line. In the discussion that followed, Mr. Masters advised paddocks of green feed for the pigs, not only for exercise, but to reduce the labor and feeding costs. For topping up, the pigs should be fed in the sty. The sties should be kept thoroughly clean and provided with a straw roof. Mr. H. Videon said the present expense involved in shipping the pigs to market and other transit charges left little or no profit for the producer. Mr. B. Evans said the best age to sell the pigs was when they could be termed "porkers." He considered iron more sanitary and satisfactory

for a roof than straw. Mr. H. Simmons said it had yet to be proved that pigs could be raised profitably in their district, but there was no doubt that to make the proposition a payable one every care should be given to the feeding and care of the animals. Mr. M. Masters then read a paper, "Farm Buildings."

YADNARIE (Average annual rainfall, 14.09in.).

May 9th.—Present: 12 members and one visitor.

**SEEDING OPERATIONS.**—In the course of a paper under the heading, "Should we Work and Sow our Land after the First Rains?" Mr. O. Forbes said in seasons such as the present, when rain had not fallen for a long period, the question was often asked, "Is it advisable to go on sowing or wait for rain?" To such a question it was hard to give a definite answer, because the farmer had to contend with a large variety of conditions. If oats were to be sown, he thought the drill could be used whilst the land was dry, but if the grain was sown for seed, then it would be advisable to wait for the weeds to germinate before using the cultivator. New land could be worked before rain, providing a good burn had been obtained. On stubble land he had found that wheat sown before rain was very subject to disease, especially if the land was of a loose character. Fallow land should never be worked until the moisture had penetrated to the depth at which it was intended to work the plough. He believed in working the drill immediately after the cultivator, generally speaking, and he thought it advisable to wait for rain before sowing wheat. In the discussion that followed, Mr. J. B. Quick thought shallow and close up drilling to the cultivator was essential in securing best returns. He would sow new land early and in dry condition if necessary. Mr. P. G. Dolling would not sow fallow land until rain had fallen. He favored shallow drilling, and would sow new land early, especially light sandy soils. Mr. A. C. Kruger believed in breaking up new land as early as possible to let the air into the soil, so that when rain fell the soil would take up the moisture more evenly, especially in undulating country. He thought four days would be long enough to allow weeds to germinate on fallow after a good rain. The Hon. Secretary (Mr. J. H. Kruger) said it was necessary to sow oats before rain, so as to be ready to start on wheat after rain had fallen. He favored shallow sowing at all times, and would use a light set of trailers attached to the drill or covering seed left uncovered, in preference to harrows, as the former would not drag the rubbish. He agreed with Mr. A. C. Kruger's remarks, and would sow new land dry if rain did not fall in time. If fallow land was in doubtful condition, he advocated cultivating to destroy weeds that had germinated, but would not advise sowing, and would rework same after further rain had fallen. Mr. W. L. Brown said the best time for sowing was from the middle of April to the middle of June. Under certain conditions and in favorable seasons one could start earlier and continue later. Where dandelion and barley grass were troublesome it was quite necessary to wait for rain before starting tilling operations. He favored shallow drilling, and thought harrowing after the drill undesirable on clayey soils, because it tended to set a hard crust on such land.

#### YEELANNA.

June 10th.—Present: 20 members.

**BREEDERS' CLUB.**—Mr. J. Cronin, who read a paper on this subject, was of the opinion that the time had arrived when the farmers in the Yeelanna district should breed and rear at least sufficient horses to replace those animals that became too old for work, and those that died from other causes. Up to the present time farmers had not been able to spare their mares for breeding, because all the horses were required for farm work throughout the whole of the year. It was generally recognised that horses bred on the farm were to be preferred for farm work to those purchased from outside sources. If the farmers adopted breeding, he thought a draught stallion that would tend to throw colts heavier and larger than the dam should be obtained. Farm horses in their district were somewhat on the small and light side, and he thought that if a breeders' club was formed, and a good stallion secured, the effort would very soon pay for the outlay of capital that would be involved in purchasing a horse of the right type. It would be necessary to have the determined and whole-hearted support of the residents in the surrounding districts. Members agreed with the proposal, but they did not approve of a company concern for the possession of a stallion.

**KOONIBBA**, May 11th.—The meeting was devoted to the consideration of suggestions for the reorganization of the Branch.

**KOPPIO**, May 22nd.—Mr. C. P. Hodge (Instructor for Mallee Lands) visited the Branch, and delivered an address, in which he dealt with the subjects, "Rotation of Crops" and "Take-all."

**LAKE WANGARY**, May 6th.—Several subjects, including "Barley pooling," "Stinkwort poisoning of sheep," and "Freezing works for Eyre Peninsula," were brought forward, and an interesting discussion took place.

**LAKE WANGARY**, April 8th.—Mr. J. Shepperd read a paper, "Making the Most of the Clip," and an interesting discussion followed. Mr. Houston extended an invitation to members of the Branch to inspect some stud sheep that he had recently purchased.

**MALTEE**, June 9th.—Mr. Shorne introduced the subject, "Sore Shoulders on Horses." This provoked an animated discussion, but the general opinion prevailed that good-fitting collars, with an extra horse in the team, would minimise the evil. "Feeding Horses while at Work."—This subject was discussed at length, the general opinion being that oats were the best feed, as the horses did better and travelled faster than when fed on other grain.

**PETINA**, May 27th.—The Chairman (Mr. W. Penna) gave an interesting report of the recent visit of the departmental officers. A lengthy discussion took place on the farm clip for market. Other matters that were brought before the meeting included wheat pickling, care of implements, and destruction of mallee shoots.

**PYGERY**, June 5th.—The meeting was devoted to a discussion on local topics, special interest being paid to seeding operations.

**STREAKY RAY**, June 10th.—At the inaugural meeting of the above Branch the Chairman (Mr. W. J. Williams) read a short paper, "Fallowing," and an interesting discussion followed.

**WUDINNA**, May 15th.—The Hon. Secretary (Mr. F. L. Johnson) read a paper from the *Journal of Agriculture*, "Afforestation," and in the discussion that followed, members were of the opinion that wherever possible trees should be planted and protected from vermin. It was decided that the next meeting should take the form of a social and dance.

## EASTERN DISTRICT

### (EAST OF MOUNT LOFTY RANGES)

**MONARTO SOUTH** (Average annual rainfall, 14in. to 15in.).

June 10th.—Present: 15 members and two visitors.

**FARM MANAGEMENT**.—Mr. W. Liebelt, who contributed a short paper under the title, "How to Keep a Farmyard," said all the fences should be kept in perfect order, and all pieces of wire and iron removed to a place away from the stock. The yard should be levelled off and all holes filled in with rubble. A good deal of time would be saved if the farmer made a practice of keeping the tools in one place and returning them when they had been used. The practice on many farms was to simply throw the manure outside the stables when the stalls were being cleaned out. He thought it would be a much better plan if a pit was made, into which all the manure could be tipped as it was taken from the stables. The sheds should be kept tidy and weather proof. A short discussion followed.

### RAMCO.

May 8th.—Present: 12 members.

**ORANGE PACKING**.—Mr. F. Lewis read the following paper:—Now that the orange-growing industry is increasing so rapidly in Australia, and the supply is overtaking local demands, it has become necessary to take more care in the methods of packing and marketing. Judging by the numerous complaints from fruit agents last year about the slipshod manner in which a lot of fruit was packed, it is obvious that a large percentage of the small growers have a lot to



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learn if they wish to secure top prices for their fruit. From last year's exporting experiences, in which nearly all the Murray Valley growers had an interest, we learned that oranges picked in the morning, wet with dew or rain, or with the skin punctured by a spike or bruised in any way, were not likely to keep, and should not be packed even for the interstate markets. Care should always be taken that the fruit is not thrown into the picking boxes or tins, neither tipped roughly from one box to another. As each orange has to be handled separately two or three times before it is finally packed, and then undergo a long and rough journey, the fruit will receive quite enough knocking about without careless handling in the orchard. Tins are frequently used for handling small crops. The fruit is emptied into sweat boxes, each of which will hold about two and a half bushel cases. The sweat boxes are carted to a shed, where the fruit is left for a few days to "sweat," and then packed into standard bushel or "Peacock" cases. Packing fruit in any case not officially stamped is illegal, and the grower is liable to a fine. Packing should be done on a bench, which can be made by fastening two long parallel pieces of timber for rails on an ordinary bench, or on boxes, so that when the case to be packed is placed across, one end is raised a few inches and the other butts up against the rail nearest the packer. Place the sweat boxes of fruit on the rails, as many as there is room for, and leave a space between each for the bushel cases. Washington Navel oranges are packed in recognised numbers, and provided they are uniform in size right through the case, which they must be, it is hardly possible to pack more than the specified number. Not counting those of abnormal size, the following numbers are for the "2 to 1" pack—60, 68, 75, and 83. For the "2 to 2" pack, 96, 108, and 120. For the "3 to 2" pack, 105, 120, 158; and higher for very small fruit. There are a few intermediate packs, but the above will be found sufficient for ordinary purposes. To begin, take the largest fruits in sight with the right hand, and place two across the bottom of the case; then one in front, and between, so that they fit snugly, always with the "navel" down and the stalk up. Hold these with a firm dragging pressure of the left hand, and continue two to one until the bottom layer is complete, pressing each orange into position as it is placed in the case. Having the case tilted towards you will be found a very great help. Next, with both hands, pull the packed fruit towards you, and if you can make enough space, which is probable, squeeze in one or two more oranges of the same size without breaking the skin. They should be so tight that if the case was held upside down the fruit would not fall out. For the next layer, start with one, then two, and continue as before. For the third and subsequent layers, place the stalk end down and "navel" up. The reason for this is that if the case is opened at the top or bottom, the fruit is the right way up, and has the same appearance either way. If only a few cases are to be packed, you will probably notice, before you have finished the first case, that you are using fruit just a little smaller than those used at the commencement. If so, shift the case to another part of the bench, or put it aside, and start another case of slightly smaller fruit, discontinuing that as soon as the pack begins to feel loose. By working on this system of taking only the largest fruit in sight, and working downwards, you are not likely to go far wrong as regards evenness in size. The number in the bottom layer determines the number in the case. All the "2 to 1" packs consist of five layers to the standard case; no more and no less; and if you get 12 in the bottom, the case will contain 60, or five 12's; if 14, 68, or three 14's and two 13's; if 15, 75, or five 15's; and if 17, 83, or three 17's and two 16's. Curiously enough, all these sizes will stand practically the same height in the case; nearly half an orange above the top. When you have worked your way down to fruit almost small enough to get three across the case, start on the 2 to 2 pack by placing one orange tightly in the nearest right-hand corner, and the next a little to one side so that it touches neither the first orange nor the side of the case. Then place number three in front, but hard up against the left-hand side of the case, and number four a little to one side of number two. You will find that you get only 16 to the layer this way, but you get six layers, which gives you 96. This is rather a difficult pack for a beginner, but becomes quite simple with practice. If you use fruit a little smaller, you get 18 to the layer, which makes 108, or 20 makes 120. The 2 to 2 pack can be continued with still smaller fruit by adding two to each layer, and as there are six layers in each case, the total will always be a power of 12—a very convenient number for the retailer.



The 3 to 2 pack is more simple, and is made by starting with three across, and then two, making a total of 105, composed of six layers, three 18's and three 17's. The first layer has three across at each end, the second two at each end, and so on. The next size for 3 to 2 is 120, in six 20's, and 140 in seven 20's. The latter is rather unsatisfactory, because each layer is loose, and the seventh layer causes the pack to stand too high in the case. It is better to mix this grade with smaller fruit, and make 158, in seven layers of 23 and 22. Navel oranges smaller than this should not be packed, but dumped in the case, which should be marked accordingly. Perhaps the easiest pack of any is the 3 to 3 or "square" pack, but this has very little to recommend it except its simplicity. It is made by placing the fruit for the first layer straight across the case in threes, and the second and subsequent layers directly on top of the preceding one. Its faults are that the stalks, if cut a little too long, will dig into the orange directly below or above, causing a bruise or wound, which does not happen in any of the other packs. Secondly, it tends to slovenly packing, because if the pack is 90, any size from 75 to 120 may be and very often is utilised. The above remarks are for hand grading; yet there are several machines and devices used that will do the grading fairly effectively, but none that I have seen is as sure as the expert hand packer. All require double handling of the fruit, which results in more bruising. Another fault is that the machine cannot take into account the different shapes of the navel, some of which are long and others flat; therefore the size, to a certain extent, is determined by the position of the orange as it enters the grader. It is absolutely essential that all oranges in any case should be uniform in size, and packed tightly. A good discussion followed the reading of the paper.

COOMANDOOK, May 26th.—Mr. Upton read an article, "Every Man His Own Miller," and an interesting discussion followed. The question as to the quantity of wheat to be sown was brought forward, when it was generally agreed that from 40lbs. to 45lbs. of seed to the acre was best for Coomandook and the surrounding district.

LONE GUM, May 12th.—Mr. L. A. Chapple, of the Berri Branch, attended the meeting and delivered an address, "Pruning," to an attendance of 29 members.

LONE GUM, June 7th.—Mr. W. Muspratt (Irrigation Instructor) and Mr. C. G. Savage (Manager of the Berri Experimental Orchard) attended the meeting and delivered addresses dealing with the experiments that had been carried on with cotton growing at Barmera and the Berri Orchard.

PARILLA WELL, May 8th.—The meeting was devoted to a discussion on the past season. Other subjects of local interest were also brought forward for consideration.

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**PARILLA WELL**, June 5th.—Mr. J. E. Johnson gave an interesting account of a recent overland trip he had made from Pinnaroo to Sydney. The Hon. Secretary (Mr. A. S. Young) then gave an address, in which he compared the methods of farming on Yorke Peninsula with those of the mallee lands.

**WILKAWATT**, June 10th.—A paper, "Farming To-day Compared with Agriculture 30 Years Ago," was contributed by Mr. D. S. Bowman, and an interesting discussion ensued.

**WINKIE**, June 9th.—Mr. D. C. Quinn (Viticultural Instructor of the Roseworthy Agricultural College) gave a pruning demonstration in the afternoon, and in the evening delivered an address, "Winter Treatment of the Orchard."

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## SOUTH AND HILLS DISTRICT.

CLARENDON (Average annual rainfall, 33.67in.).

April 13th.—Present: 16 members.

**PREPARATIONS FOR THE HAY CROP.**—The Hon. Secretary (Mr. T. B. Brooks) read the following paper:—"Owing to the high value of cultivation land, it is not profitable to allow it to remain idle 12 months in fallow. The rule generally followed in this district is to sow peas and the following season hay. So soon as the peas are off the land, it should be stocked as heavily as possible with sheep. These clean the land and allow the owner to get the scarifier to work. I do not believe in ploughing the pea stubble. Work up the land with a fixed or spring-tooth scarifier if possible, say 1½ in. or 2 in. deep, before the rain comes, and then with the first rain, work to 3 in. or 3½ in. deep to make a fine but not a dusty seed bed. It is better to wait for rain than to work the land in too dry a condition. If powdered to dust, the rain simply runs down the hillsides, like water off a duck's back. In the majority of years the pea stubble can be scarified three or four times when in a good moist condition, and the seed bed made ready to receive the seed the last day or two in April or the early part of May. If the soil is very lumpy the surface dries out too quickly, and there is a chance of the seed malting. Some may ask: What is to be done with the pea stubbles, covered with stinkwort, as they are this season? I suggest working the disc plough to a depth of 2 in. This implement should cut up the rubbish, so that it could be harrowed and burned."

**COLT BREAKING.**—In the course of a short address on this subject, Mr. J. Potter said the first move was to get the colt in a crush pen, place a halter on his head, and tie a knot in his tail. Next pass a rope from that to the bit and pull the head around to right or left angles with the body. The colt should then be allowed to run in the yard. After he had walked about until tired out, a bag should be placed on a stick and rubbed over his body. When he was perfectly quiet, he should be given a feed. Numerous questions were asked Mr. Potter, who gave satisfactory answers to all inquiries. The Hon. Secretary (Mr. T. B. Brooks) then gave a short paper, "Preparing for a Hay Crop in the Clarendon District," and a good discussion followed.

At a further meeting held on May 8th, Mr. H. C. Harper gave a report of the homestead meeting recently held at Mr. C. Ricks' residence at Cherry Gardens. Mr. J. Spencer tabled a fine sample of Sudan grass, fourth cut, about 3ft. high. The first cut was 6ft. to 7ft. high, second cut 5ft., third a little under 5ft.

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## KANGARILLA.

June 9th.—Present: 14 members and six visitors.

**PRUNING.**—Mr. R. G. Morphet, who contributed a paper on this subject, said before pruning operations were commenced, the secateurs and other pruning tools should be made sharp and clean. The apricot, he said, should be pruned soon after

the fruit was picked, and before the flow of sap commenced to run backwards, in order to force the fruit buds. With summer pruning, the top main leader should not be touched, but all water shoots should be removed, and the tree kept well open in the centre. The small fruit-bearing limbs should not be pruned, or they would in all probability die. By pruning in the summer, the orchardist was able to get on with the winter ploughing without any loss of time. All that would be necessary in the winter was to top the leaders that were left. The peach tree could be pruned on very much the same lines as the apricot, except that the pruning should be somewhat heavier. Referring to the treatment required for Jonathan and King David apple trees, he had found that those varieties required very hard pruning. The small limbs in the centre of the tree, where the fruit buds were some distance apart, should be spurred back to 3in. or 4in., in order to force the development of fruit buds. The top branches of the Cleopatras should not be pruned more than was absolutely necessary, for he was of the opinion that by topping the branches and heavy pruning there was a danger of the fruit becoming affected with bitter pit. To assist in the prevention of bitter pit the affected wood should be cut out, and not top the branches any more than could be helped. If the branches grew too lengthy, they could be cut back to the main arm, and so assist the limbs in making a stout development capable of bearing a good crop. Dunn's Seedling and Munro's Favorite should be well pruned in the centre, and the tops cut well back, for each variety had a tendency to make straight growth. The trees bore large crops in alternate years, and for that reason should be pruned somewhat heavily, to save the limbs from breaking and spoiling the shape of the tree. Rome Beauty was also inclined to make straight growth, and should be opened out in the centre even more than Dunn's Seedling, as they did not ripen until later in the season. Duchess was one of the best varieties of pears for their district, and should only be pruned every other year. The majority of pears made a very straight growth, and for that reason it was necessary to keep the centre of the trees well opened out, and to cut back the long, straight shoots. The small limbs in the centre should not be pruned back too heavily, excepting when they were too lengthy, and when the buds were a long way apart. All cuts should be clean and made close to the buds, and against the ones that were on the outside. That would induce the tree to make an outward growth, while by cutting close to the buds there would not be so much dead wood on the tree. Young trees that had not borne a crop should not be pruned too heavily, just sufficient wood being removed to form a well-shaped tree. If the tree was sickly, and was not making very much growth, it should be pruned more heavily than the tree that was making strong headway. In replying to a question regarding the non-bearing of young peach trees, Mr. Morphett said the trees should not be pruned until after they had carried a crop. Mr. Baker asked what was the cause of the fruit falling off peach trees when nearly ripe. Mr. Morphett was of the opinion that the tree required moisture, and it would be noticed that after a heavy rain the sap would commence to flow, and so cause the fruit to fall. He also stated that it would not injure peach trees to prune them whilst in flower.

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#### RAPID BAY.

June 10th.—Present: 20 members.

FARM GARDENING.—In the course of a paper under the heading, "Farm Gardening for the District," Mr. C. Repchange said he intended to deal with the paper in two sections—first, for operations during the winter or rainy season, and, secondly for that portion of the year from April to the middle of September. He considered that successful operations without a great deal of hard work could be summed up under the following six headings:—(1) The plot to be only sufficiently large to give a continual supply through the months mentioned; (2) the protection of the garden against animals and wind; (3) thorough fertilisation and cultivation; (4) selection of good plants and seeds; (5) raised beds, hoeing, and mulching; and (6) effective destruction of insect pests. Dealing with the first sub-heading, he had found that for a family of six, a plot 66ft. long by 30ft. wide would prove of ample size. The long side of the block should face the prevailing winds, and a permanent path should be made through the whole length of the plot. For a serviceable vermin-proof fence he recommended the erection

of slabs or saplings, 5ft. 6in. above the surface of the ground. Such a fence would also break the force of the wind. If procurable, the speaker suggested an application of cow manure to the plot, in those instances where ordinary well-rotted stable manure was not available. Should any of the vegetables yield exceptionally good crops, one of the plants should be allowed to run to seed, so that good seed for the following season's crop would be on hand. Where the seed could not be secured from the plot, it should be purchased from a reliable source. When preparing the seed boxes, he had found that by baking the soil in the oven of the kitchen stove, a great deal of trouble from weeds would be avoided. Where the garden had been heavily manured and properly worked, raised beds would be found to give the best results. A mulch of fresh stable manure with fowl droppings, and a sprinkling of lime applied after hoeing, would make a fine tilth for the next cultivation. For the eradication of pests during the rainy season, he stated that tar water gave lasting and beneficial results. For grasshoppers and large grubs, baits prepared from Paris green and pollard were recommended. Regular dustings of lime over the whole of the plot not only kept the slugs in check, but also benefited the soil. He was also an ardent supporter of the use of chimney soot to obtain the same results. When planting out cabbages and cauliflowers, he adopted the practice of setting out the plants, and then placing a lettuce between each cabbage or cauliflower. To obtain the best results from white stone turnips, a severe thinning out should be performed when the plants were quite young. Broad beans always did better if planted further apart than the regulation distance (5in.). They should be set out 8in. apart, and if well staked and then pinched back after about 20 flowers were in bloom, the best results for that district would be secured. Carrots—The early horn was the speaker's favorite variety of carrot, because they matured very quickly, and could be pulled when half grown. The Yorkshire Hero was undoubtedly the best pea for that district. The gardener should always take the precaution of running a few threads of strong black cotton about 6in. above the plot, after the peas had been planted, to protect the young plants from the sparrows. It was a good plan to stake all varieties of peas, as they were not able to withstand any strong winds. As the end of the rainy season approached, the winter garden could still be utilised, if good deep holes were made in the beds that were idle. The holes should be filled with refuse, and then hilled up above the surface of the ground. On these beds young plants or seeds of trombones, cucumbers, &c., could be set out, and if watered with all the slop water and an occasional soaking, good results would be secured. In selecting the site for the summer garden, the western side of a stream would be preferable, as it would receive the rays of the morning sun. If possible the soil should be of a sandy nature, rather than a stiff, loamy soil. If desired, the plot could be long and narrow, in order that it might follow the track of the water course. A strong netting fence should be erected to protect the plants from the ravages of rabbits. He believed that the secret of successful summer gardening lay in the digging of a fair-sized pit just before the entrance of the water race to the garden, and then placing fresh manure in the pit at frequent intervals. If that was done, the whole of the garden could be flooded with liquid manure in one operation. In such a case it would, of course, be necessary to have all the beds below the paths. The paper then concluded with a list of vegetables suitable for summer planting. During the discussion that followed, the subject "Destruction of Garden Pests" was brought forward, when a member stated that 1gall. of coal tar to 24galls. of water, which should be boiled for mixing, made an excellent and effective spray for many pests that attacked vegetables. Some members did not favor mulching during the winter. They contended that a regular surface hoeing would give better results.

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BALHANNAH, June 9th.—Mr. A. Filsell read a paper, "Pruning," and an interesting discussion ensued.

BLACKWOOD, June 19th.—A discussion took place on the subject, "Woolly Aphis." The Hon. Secretary (Mr. A. A. Magarey) presented the annual report, and the officers were elected for the ensuing year.

**IRONBANK**, April 7th.—The meeting discussed the coming Winter School for Farmers at Roseworthy Agricultural College, and two members were nominated for attendance.

At a further meeting held on May 12th, the Hon. Secretary (Mr. H. E. Tucker) read articles dealing with timber conservation in Western Australia, and spraying fruit-trees with nitrate of soda. The latter subject caused a great deal of discussion, and generally members doubted the efficiency of such a spray.

**LONGWOOD**, May 13th.—The annual meeting of the Branch was held at Mr. W. H. Hughes' homestead. After an inspection of the property a report of the work done during the past year was presented by the Hon. Secretary (Mr. J. R. Coles), and the officers were elected for the ensuing term. Afternoon tea was provided by Mrs. Hughes.

**MORPHETT VALE**, May 11th.—Prices of stock, possibilities of the pig-raising industry, ailments of pigs, and other subjects of timely interest were brought before the meeting and a profitable discussion ensued.

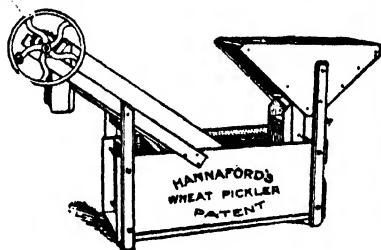
**MORPHETT VALE**, June 8th.—The principal subject for discussion was the curing of pork. A member gave an instructive account of the methods followed in a Victorian factory, where everything possible was done by machinery, and the pork cured in large tanks. Other subjects that were brought forward for discussion were "The Late Sowing of Early-maturing Wheats and Barley" and "The Merits of Different Wheats for Hay."

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ROCKWOOD, June 5th.—The Hon. Secretary (Mr. H. Deiner) read an article, "Olive Growing," from the *Journal of Agriculture*. A short discussion followed. Members were of the opinion that olive growing would not pay the average farmer. Birds in that district were very destructive, and harvesting operations came just at the busiest period of the year. Labor and methods of gathering the berries were also not in favor of the industry. Some members found olives good food for poultry. The officers for the ensuing year were then elected.

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## SOUTH-EAST DISTRICT.

### MOORAK.

May 5th.—Present: six members.

FARM GATES.—The monthly meeting of the Branch was held at Mr. J. Boardman's homestead, when the following paper was read by Mr. W. A. Palamounit:—"As one goes about, it is surprising to notice the number of different contrivances that are employed as gates. One may have two or three sticks and several pieces of wire (in most cases barbed wire) dragging on the ground; another a couple of light rails; another prefers to stand the harrows or drill up at the gateway. A neat and serviceable gate could be made by any handy man with little more expense than the cost of the timber, the expenditure of a few hours' labor, and certainly in less time than is employed in the continual putting up and down of the slip-rails, or the carrying round of the barbed-wire entanglements, to say nothing of the time lost in freeing one's clothes from this pest. Tidy, useful gates of a uniform pattern improve the appearance of, as well as add considerably to the value of, the farm, and it is only those who have replaced a gate where once a makeshift did service who know the true value of the better article. Besides being a continual source of annoyance to a person's body and clothes, the barbed-wire substitute often causes serious results to stock. Horses and cattle gallop into them, and receive cuts on the teats or lifelong blemishes, and unless they are kept tightly fastened—which they seldom are—cause stock to become hung up in them. There are a great many types of gates to choose from, and so many things to be considered when recommending a gate—the position in which it is to be placed, the amount of service that will be required of it, whether it will be required to be sheep-proof, whether machinery of the larger type is likely to be in use on the farm, or whether dairying is the main business on the farm, and where, therefore, large gateways are not so necessary. To make a hard and fast rule in a paper of this kind is impossible, and it is my intention to deal principally in connection with holdings similar to our own on Moorak, and to suggest the kinds that have proved useful and economical on my present holding. I would suggest, for general farm use, that the gates be made of hardwood. Here I realise an objection may be raised on account of its heaviness, for a heavy gate is generally the principal cause of its own inefficiency and final destruction. That, again, depends on certain things—the manner in which the gate is made, and how it is hung. When a gate is made or purchased, we naturally expect it to last a number of years, therefore I would say:—1. Make it well. 2. Procure good hinges. 3. Swing it on to a solid post. For general use on farms I would strongly recommend single gates in preference to the double. Even where cultivation is carried on, I believe they would be better, because they are easy to open, and require less attention where horses are being handled. With regard to the width of gates, there are, I believe, very few gateways made much under 12ft. This is the most popular width, but for general use I find that the No. 2 design, made 11ft. wide and hung on a good solid post, will answer admirably. Of the numerous styles of gates, those made in the manner set out hereunder have proved most suitable and convenient under my conditions, these few designs being suitable for paddocks and yards. The measurements and prices that I will submit are all approximate, and are for the material used only, and I have not included the cost of labor in making nor the hinges. No. 1 Design.—This type of gate will be found to be an ideal main yard gate; I would not say main entrance gate, because one can very easily construct

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THE AGRICULTURAL BUREAU.—Particulars of this Organization, of which every farmer should be a member, can be had on application to the Department.

or buy one a little more ornamental than this. This gate is what is familiarly known to us as 'The Coola' gate, measurements being as follows:—Four rails, each 12ft. long, 4 x 1½ timber; hanging head, 8ft. long, 4 x 3; closing head, 4ft. 3in., 3 x 2; one picket in centre, 3ft. 9in., 3 x 1; one brace, 14ft. long, 3 x 1; one ditto, 6ft. 6in. long, 3 x 1; 21 bolts and nuts; approximate cost, 16s. 8d. The first rail would be 6in. from the top of the closing head, and other spaces, 9½in., 9in., and 8½in. respectively. Hinges for a gate of this description would need to be either good strong iron T hinges or strong eyebolts. In connection with this gate there is one disadvantage, viz., that the long head is apt to catch the wagon frame. No. 2 Design.—This is practically the same design as No. 1 gate, only that it is 11ft. long and has no long head. Timber and measurements are as follows:—Four rails, 11ft. long, 4 x 1½; spaces for same, 8in., 9½in., 9in., 8in. respectively; hanging head, 4ft. 6in. long, 4 x 3; closing head, 4ft. 6in. long, 3 x 2; picket in centre, 3ft. 9in., 3 x 1; two braces, 6ft. long, 3 x 1; 20 bolts and nuts; approximate cost, 13s. 10d. No. 3 Design.—This gate, although not quite so strong and big as the others, has proved an ideal gate in a race leading out of a yard. The measurements are as follows:—Four rails, 11ft. long, 3 x 1½; spaces, 6in., 9½in., 9in., and 9in. respectively; hanging head, 4ft. 6in., 4 x 3; closing head, 4ft. 3in., 3 x 2; picket in centre, 3ft. 9in., 3 x 1; two braces, each 6in. long, 3 x 1; 20 bolts and nuts; approximate cost, 12s. 3d. This gate could be swung on a block fastened on top of post and in block in the ground. No. 4 Design.—Four rails, either 10ft. or 11ft. long, 6 x 1; hanging head, 4ft. 6in., 4 x 3; closing head, 4ft. 6in., 3 x 2; picket in centre, 3ft. 9in., 3 x 1; two braces, each 6ft., 3 x 1; one brace, 10ft., 3 x 1; bolts and nuts; approximate cost, 13s. 3d. This gate, being constructed of 6 x 1 rails, needs to be well braced, and I have found that a gate of this kind, made 10ft. long, is very serviceable, and if made of lighter timber would not require such heavy hinges. You will probably notice that in these remarks I have omitted to mention nails. I have a reason, and it is this—that in the making of a gate we expect to have something that will last for a number of years, and the writer has had the experience—in fact, bought it—that to expect a gate to do service and hang together for any length of time that has been put together with nails is impossible, and I would lay particular emphasis on this point—when making a gate, use bolts, nuts, and washers. When hanging a gate do not think that any old post will do; take a little time and secure a good solid post, and then there will not be so much danger of the gate sagging. I would not advocate the swinging of gates on strainer posts of the fence, unless, of course, one has a good solid post, or is hanging a light gate. Gates cannot be said to be finished until they have been painted, and the soundness of painting as an investment cannot be gainsaid. It would be a good plan if the timber, after being cut for the gates, was given at least one coat of paint before being put together. After being completed and hung, they could then be given a final coat. The price of paint at the present time being almost prohibitive, tar, thinned with kerosine, would make a good substitute. For the completion of our work we must have a fastening of some kind on our gate, and here again we could not do better than follow the plan adopted by Coola Station, and have a fastening that will last a lifetime. Most of us are familiar with the one they use—the chain, ring, and knob. If the price of these (3s. 6d.) is prohibitive, there are plenty of good substitutes on a farm that will come in very handy for this purpose; but in this regard a note of warning is essential: Do not place a spike or projecting piece of iron in the post, so that a beast, when coming through the gate hurriedly and turning suddenly, will be liable to injure itself." In the discussion that followed, Mr. J. Nicholls said he could not altogether agree with the writer's view of single gates. He himself favored the double gate, especially where sheep were being handled, and the trouble of stock rubbing on them could be overcome by the binding of barbed wire on the top rail. The President (Mr. J. F. Boardman) also favored the double gate. With the single gates there was always a tendency to sag and make them difficult to open. Mr. A. Ferguson favored the single gates.

MOUNT GAMBIER (Average annual rainfall, 32in.).

May 13th.—Present 18 members.

THE POTATO INDUSTRY.—The following paper was read by Mr. R. Smith:—The land should be cultivated to as fine a condition as possible, and for early cropping I advise planting from now until next August such varieties as Early Manistee



and No. 1 Carmen. These need be planted only 18 in. apart and 2 ft. between the rows; but as the planting season advances the sets require more room for cultivation to retain the moisture. The land should face the east, and be above the line of frosts. For late potatoes a piece of damp ground is needed to grow them successfully, for they will not mature properly on land that becomes too dry, unless you have good summer rains. Therefore I would not attempt to grow late potatoes except on damp situations. We still have a lot of damp land in the South-East, and if this is properly cultivated and well manured it should grow first quality potatoes—potatoes unaffected by worms, as they are when grown on dry soils. It is most essential to plant good seed, for otherwise all the expense and trouble to which one is put will be wasted, and simply on the one point—bad seed. I am sure it would pay those in the most favored parts of our district to grow potatoes for the sake of seed alone, for, if carried out properly, the produce of their crops would easily command a higher price than the average ruling rate, by virtue of the fact that it would be selected and reliable seed. I find that it pays to change the seed every year from a different class of soil, for potatoes do not do so well when planted on the same soil continuously. Mr. Smith also tabled some fine specimens of his own seed potatoes. These comprised No. 1 and No. 2 Carmens, Early Manistee, and Bismarck. Mr. Smith told members that it had been his experience that one acre of selected and sprouted seed would produce twice the crop that seed sown in the usual haphazard manner would. It was possible to secure two crops a year from the Early Manistee variety. If the seed were planted in March the first crop would be ready to dig at the end of July. The seed was then planted again in October. Of course, only one crop would be secured the next season. Mr. G. T. Gurry said fresh land would grow potatoes as well as it did in the past, but it soon became stale. Mr. Smith said he had secured a yield of 7 tons an acre in his paddocks, and 11 tons an acre in his garden from Early Manistees. Of course, last season was particularly favorable for the growing of potatoes. Cut seed and round seed should be alternated year by year, or the crop would soon run itself out. He did not favor very large potatoes for seed. Mr. A. A. Sassanowsky said he had grown potatoes for the last 30 years, and had experienced a difficulty during the last decade in securing the yields he had in the past. The reason for that had been suggested that the soil was losing its quality. One of the reasons why the cultivation of the potato was being neglected was that the Moorak and other estates had been subdivided and the new settlers had embarked upon the dairying industry. If the grower had gone in for the careful selection of the seed the present position would not have arisen. However, it would be impossible in the case of large areas for the grower to go through his crop and select the best seed. Therefore they had found it a better proposition to import seed. Two or three crops were grown from that seed, and then another supply was secured. At the present time large areas of land suitable for the cultivation of potatoes were being cut up, and if the growers would only put their energy into it they could grow crops as good as those in the past, particularly early varieties. The last few seasons of dry weather and the scourge of grubs had prevented good yields being secured. He was also of the opinion that local growers did not cultivate their land sufficiently. He had found the policy of sprouting the potatoes a very profitable one, and he had also discovered that the practice of "greening" the seed before planting also assisted materially with the yield. The potatoes were spread out in the sun until the skins reached a green color. He had found that seed treated in that manner appeared far more virile than others, with the result that they produced a heavier yield, and also resisted the ravages of disease. A planting machine was also a necessity, for it was only by mechanical means that correct spacing between the rows and each plant could be secured. A manuring appliance could also be attached to the same machine. By the introduction of these improved methods he was confident that they would again secure yields of 10 tons to 11 tons an acre. Mr. H. H. Orchard (Orchard Inspector) agreed that it was the general practice to keep the inferior potatoes for seed and bag and dispose of the better sample. He had seen splendid Carmens from a soldier's block at Mount Schank. Portions of the crop had been exported to the eastern States and to the West, and he knew that return orders had been booked. Potatoes were grown on a three-course system in America. Cereals were first planted, and after that clover was grown on the land in the autumn and allowed to stand until the winter of the following year.

A heavy dressing of farmyard manure was then applied and ploughed in. Twelve months later the area was placed under potatoes. By that practice the occurrence of the scab was avoided, for potatoes planted on top of freshly placed manure were apt to develop scabbiness. Care should also be exercised in digging, because the tubers were apt to be spoiled by carelessness.

MUNDALLA (Average annual rainfall, 23.04in.).

April 10th.—Present: 17 members and visitors.

**FARMING.**—In the course of a paper under the heading "Farming as I See It," Mr. J. R. Dinning compared the business of farming with the word "business" in the generally accepted term, and drew a comparison between the returns in each case. He considered better methods and greater energy were essential to success, a more economical system was necessary. He thought the time not far distant when grain crops would be mowed and threshed, and the straw used for fodder. While he acknowledged the scarcity and high cost of labor, he thought it possible in many instances to achieve better results. Organization was very necessary to get one kind of work out of the way before the next operations were due. Care of farm implements was another factor that was frequently lacking. He had often noticed that those who were first to finish harvesting operations were the ones who appeared to have things in better order.

**PROBLEMS CONFRONTING THE FARMER.**—In opening a discussion on the subject, "The Greatest Problem Confronting the Man on the Land," Mr. R. Hunt, of the Bordertown Branch, said that individually there were many different problems confronting farmers, and each in a different way according to locality and circumstances. To the West Coast farmer, for instance, the scarcity of water through scanty rainfall, &c., might be his greatest problem, while too much might be a problem to a man in quite another locality. But dealing with the question on broad and general principles, he thought the greatest problem was how to secure greater production proportionate per unit on smaller areas. Evolution of machinery and scientific principles made that necessary. There should be co-operation between producer and consumer, and with improved machinery and better marketing conditions the cost of production should be lessened. Employer and employee should be bound by a common interest. Class distinctions should be abolished and a healthy spirit of co-operation substituted. Mr. E. Milne dwelt on the question of supply and demand, and particularly on the matter of economy. Material that was now cast aside and destroyed could be utilised as fodder for cattle. The great problem confronting them was that of centralisation. There were more people in one English city than in the whole of the Commonwealth. It had been said of Australia, "Produce more on lesser acres and induce greater population." That, with the elimination of waste and the utilisation of by-products, would go far to solve the great problem of increasing the rural population. Mr. Hodges said there was another aspect of the question which was often overlooked, namely, that of the conditions under which women worked. Often year in and year out, early and late, the wife and mother went through the round of monotonous toil with little or no break—from seeding to shearing, to hay and wheat harvest, accompanied by long hours and interminable lunches, which could often be lessened. From January to December in each year the same monotony was enacted; the family grew up, visited the city, and instead of wishing to return home, yearned to stay there, hence the exodus of these young people to the city. At best there were natural disadvantages. There was frequently talk of the scarcity of educational advantages in the country. That, in isolated cases, might be so, but in a large number of cases Government departments were doing their best, not only to meet the requirements of the people, but to induce them to avail themselves of the opportunities offered, which a majority refused to do. The Tatiara district was one example of many. If the question of rural population was to be solved, heartier co-operation amongst the people was necessary to bring about a better and brighter social environment, and having got the population, other disabilities could eventually be remedied. Mr. G. A. Dinning corroborated the remarks of the various speakers, and said labor was too dear, and he thought greater economy should be practised. Speaking on the labor question, Mr. Hawker thought a bonus

system might work to advantage, and be an incentive to the working man to leave the city. The receipt of a percentage of the profits might bring about the co-operation urged by previous speakers. Mr. J. Ryan agreed with Mr. Hawker up to the point of profits, but wanted to know how it would act in the case of a loss. He favored intense cultivation. In England land was continually under cultivation. What was done there could be done in Australia, and might be an inducement for people from the city, and even overseas, to settle in our rural districts. Mr. Knowling thought that centralisation was the question of the moment. People were frequently leaving for the city in large numbers, with the result that 57 per cent. of the population were living within the city area.

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PENOLA (Average annual rainfall, 26.87in.).

June 10th.—Present: five members.

FARMING CONDITIONS IN THE NORTH AND SOUTH-EAST.—Mr. E. L. Russell contributed a paper contrasting the farming practices of the northern districts and those of the South-East. Continuing, he said:—"Last season I had 100 acres under Duckbill barley and 33 acres under Algerian oats and Queen Fan wheat, both mixed for hay. The barley crop averaged about 45bush. The land was fallowed to a depth of from 4in. to 5in., left for three months, cultivated several times, harrowed, and drilled in July and August with 1½bush. of barley and 1cwt. of superphosphate to the acre. From 25 acres the return was 57½ tons of hay; the land was fallowed, cultivated, harrowed, and drilled in June. In my opinion the best time to sow wheat or oats in the South-East to secure the best results is early in June, and barley the latter end of July and early in August. I think farmers will find it necessary to use more superphosphate to the acre than has been sown, and only put into the ground good, clean, plump grain. A good stubble burn is essential. This not only cleans the ground for ploughing, but there remains a big percentage of potash, which is turned in when ploughed. I strongly advocate more fallow and cultivation to be done to obtain increased yields." In the discussion that followed, Mr. Marcus was not in favor of deep ploughing because of the danger of disturbing the sour subsoil. He agreed with Mr. Russell in fallowing and working the land as much as possible, and by using a plentiful supply of phosphates, and thus increasing the growth of natural grasses after the crop had been taken off. Mr. Yeates was in favor of more land being fallowed to a depth of 2in. or 3in. Mr. Trezise explained that a fine tilth was necessary to minimise the evaporation of moisture.

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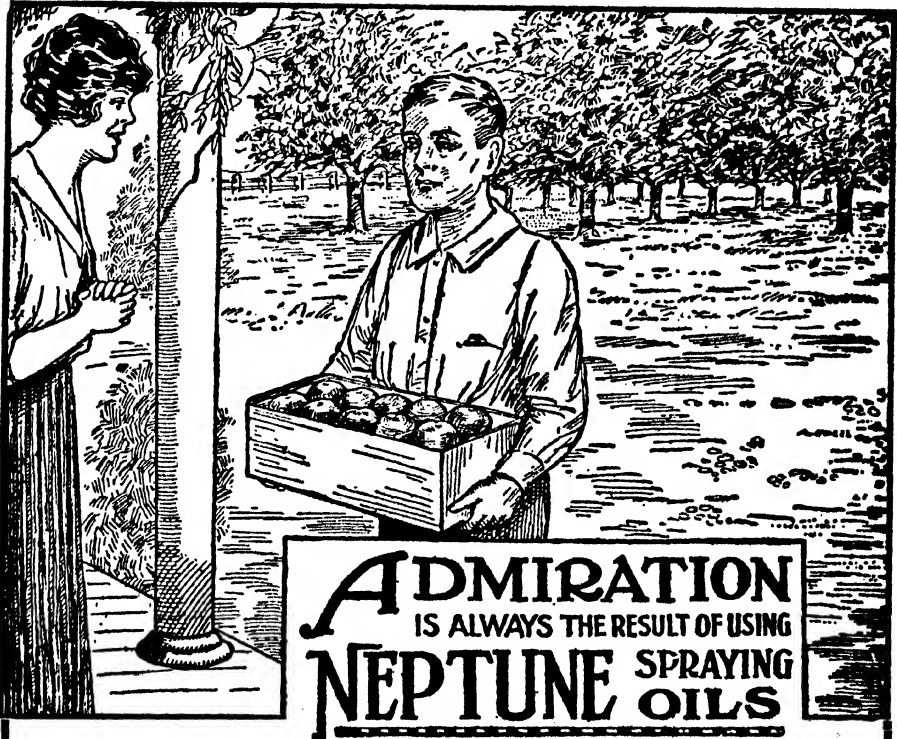
FRANCES, April 29th.—The Hon. Secretary (Mr. A. Pfitzner) read a paper from the *Journal of Agriculture*, "The Blowfly Pest," and a long discussion followed.

KALANGADOO, May 20th.—Mr. E. S. Alcock (Field Officer for the South-East) attended the meeting, and delivered an address, "Growing Fodder Crops for Dairy Cows."

MOORAK, June 9th.—The Assistant Dairy Expert (Mr. H. J. Apps) and the Field Officer for the South-East (Mr. E. S. Alcock) attended the meeting in connection with the formation of a herd testing society. Mr. Apps spoke on the benefits to be derived from the formation of a society, and dealt with the question of feeding calves on whey.

RENDELSHAM, May 10th.—Mr. S. S. Smith read a short paper, "The Manufacture and Treatment of Superphosphates, and an interesting discussion followed.

TATIARA, May 27th.—The Hon. Secretary (Mr. C. S. Wylie), who attended the Annual Conference of South-Eastern Branches, held at Mount Gambier on April 26th, gave a report of the proceedings of the gathering, and an interesting discussion followed.



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